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THE DOCTOR AND SOCIALIZED MEDICINE*

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WILMINGTON

Today our country enjoys the highest standard of medical care in the world. It is the earnest desire of the medical profession that this high standard not only be maintained but that it be advanced. The task before the medical profession is to provide adequate medical care at a price which is fair to all the people, including those who render the service. However, I would like to emphasize the point that providing adequate medical care for all the people, including the indigent, will accomplish very little toward the solution of their social and economic problems if provision for food, shelter, and work to establish a decent standard of living is not maintained.

In his annual report for the United States Public Health Service for the year 1938 Surgeon General Thomas Parran said: "A greater advance has been made in public health in the United States during the past two years than ever before within a comparable period." In this report he states that the general death rate for the year 1937 was 10.9 per 1000 population as compared with 11.3 the preceding year. The infant mortality rate in 1937 was 54.4 per 1000 live births as compared with 57.1 for 1936. The maternal mortality rate was 4.6 per 1000 live births for 1937 as compared with 5.3 in 1936. The infant and maternal death rate is a good index to general health conditions.

During 1937 lower death rates were recorded for typhoid fever, diphtheria, malaria, scarlet fever, tuberculosis, nephritis and puerpural sepsis.

From a health standpoint 1938 was the best year in the history of our country; yet, the health reformers in our present federal administration declare "the health needs of our people can no longer be ignored." They would have it appear that the medical profession is indifferent to the medical needs of the country.

Approximately 94 per cent of all deaths from diseases 50 years ago were from acute illness, chiefly infections; today 75 per cent of all deaths occur from chronic illness. Three out of four of our deaths from disease today are caused by ten diseases. They are, in order of rate of mortality, heart disease, cancer, pneumonia and influenza, cerebral hemorrhage, nephritis, tuberculosis, diabetes, diarrhea and enteritis, appendicitis, and syphilis. All but three of these are chronic diseases. The life expectancy in 1870 was 40 years and in 1935 the life expectancy was 60 years.

In 1900 the average American citizen lost 28 days per year as the result of illness, while in 1938 he lost only 8 days.

Organized medicine is in accord with the objectives of those who advocate socialized medicine. It is their proposed method of accomplishing this objective that we most strenuously object to. Some of these objections will be discussed in this paper, and a fair appraisal of their merits attempted.

Socialized Medicine Defined

The term "State Medicine" is a rather broad and indefinite one. In order that we may more clearly understand what we are talking about and what we are objecting to in it, a definition is attempted.

In our State Society we recognize and accept a method of treating the mentally sick in our State-supported and State-regulated institutions. Our State Health Department is an institution which we respect and sup-

*Presidential address, read before the 86th annual session of the Medical Society of the State of North Carolina, on board the Queen of Bermuda, May 10, 1939.

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port by taxation. The County of New Hanover and the City of Wilmington pay to James Walker Memorial Hospital $50,000 annually of tax money to hospitalize the indigent of that county.

We point with pride to our two State-supported Tuberculosis Sanatoria, one at Sanatorium and the other at Black Mountain. We feel that there is none better anywhere. We know that our Superintendent, Dr. P. P. McCain, and his assistant, Dr. S. M. Bittinger, have no superiors and we are backing them 100 per cent. We believe that the management of tuberculosis and the control of its spread can be handled best by State-supported institutions with the assistance of private institutions. We are so sold on this idea that we are now rejoicing that eastern North Carolina is to be the site of a third such institution in our State. We are in accord with the National Health Program that more hospitals for the treatment of tuberculosis should be built.

In the field of Public Health Education the medical profession has realized for a long time the value of socialized medicine *within proper limits.* Here may I emphasize that *the field of treatment to those able to pay does not come within this province.*

Then, to what type of Socialized Medicine do we object? This can probably best be defined by quoting from the House of Delegates of the American Medical Association for the year 1922. "State Medicine is hereby defined for the purpose of this resolution to be any form of medical treatment provided, conducted, controlled, or subsidized by the federal or any State government or municipality, excepting such service as is provided by the army, navy, or Public Health Service and that which is necessary for the control of communicable diseases, the treatment of mental diseases, the treatment of the indigent sick, and such other services as may be approved by and administered under the direction of or by a local county medical society and not disapproved by the State Medical Society of which it is a component part."

Dr. Peter Irving, Secretary of the Medical Society of the State of New York says: "When the state endeavors to extend its medical activities to the treatment of self-supporting patients, threatening to accompany the doctor across the threshold of the sick-room and place the hand of the government upon the patient's pulse, then the doctor must clearly register his remonstrance."

The Interdepartmental Committee was appointed to study and co-ordinate health and welfare activities. From the result of their study we were to be advised the best method of approach to a solution of medical care for all the people. The entire personnel of this committee favored socialized medicine before they were appointed to the committee. On account of this viewpoint it was difficult for them to reach but one conclusion, that conclusion being that only the State could handle this big medical problem and that compulsory health insurance was necessary for its completion. Organized medicine strongly objects to both of these conclusions. To the first point, we contend that organized medicine is the only body equipped by training and experience to administer medical care. Second, we contend that compulsory health insurance is expensive, bureaucratic, and detrimental to good medical care. From experience gained by countries which have Compulsory Health Insurance we learn that the standard of medical practice is lowered, the free choice of physician is not maintained, and that the cost of medical care mounts high while the service to the people becomes inferior.

The Attitude of the American Medical Association

The House of Delegates of the American Medical Association in session in Chicago in September, 1938, approved all the proposals of the National Health Committee *with reservations,* except compulsory health insurance, to which it made strenuous objections. Organized medicine is in accord with the government health program in the main, and it is our duty to do all in our power to accomplish the most possible that is good in this program. Our difference arises in the modus operandi of its accomplishment. We must work in harmony to try to accomplish our aims.

First, we know that the medical profession is the only group qualified by training or experience to administer or supervise administration of medical care. The government proposes to take men with no training and no experience, except political, and have them advise the doctor how he shall treat his patient. Could we as physicians advise

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the lawyer, the architect, or the banker how to carry out his job? We could, but the result would be that the workman would be handicapped, and the result of his labor would be an inferior product if not a complete failure. This same type of end product will be the result of lay interference in medicine, in addition to which will be increased human suffering. Is this what we want?

Second, those who are backing this program insist that compulsory health insurance is the only method that will insure the success of this plan. If such be their conclusion, may we suggest another period of study, which, if honestly used, would show some evils of compulsory health insurance in other countries. Health plans, such as are now in use in the United States and Canada, demonstrate that the medical profession can handle this problem satisfactorily without interference of the government.

Third, our federal government is fast approaching the constitutional limit of our national debt. This proposal would impose an additional burden of 4-4½ per cent of our entire national income. There certainly does not exist an emergency of such proportions, if any emergency of any kind exists. There are other more practical, more economical, more satisfactory and more acceptable plans of handling this problem, which we advocate being tried. Progress in any line is made by trial and error. All reasonable opportunities should be given plans that are now in operation or in process of execution whereby groups of persons may receive medical care. It is imperative, however, that *all plans shall be worked out in collaboration with the medical profession.* Today there are 40 countries in the world that have State Medicine or health insurance more or less controlled by the government. There is not one of these systems which we would want in this country. Adoption of any one or part of any one of them would lower our standard of medical practice.

The American Medical Association approves the following recommendations of the National Health Association.

First, the expansion of the public health service with the provision that the funds spent shall not be used for the treatment of patients who are financially able to pay for medical care. At this point the rights of the private practitioner begin.

Second, it accepts the mandate that "the care of the indigent is the responsibility of the government", and the medical and allied professions.

Third, in the matter of expansion of hospital facilities the American Medical Association opposes this proposed expansion until a definite need is established. There are now in the United States 6,800 hospitals, of which 6,218 are registered by the American Medical Association. These hospitals report 25-35 per cent of beds unoccupied. If some plan could be worked out which would enable these unoccupied beds to be used by the indigent and paid for by Federal, State or local funds, the existing hospitals would be able to render a much greater service to the community with much less financial strain.

The existing hospitals should be encouraged to expand and increase their bed capacity before new hospitals are built. The majority of the hospitals in this country are non-profit institutions. It is easy to see that many of these worthy institutions would of necessity have to close their doors when government-run hospitals open to compete with them. The hospital load would thereby be increased. Grants, as given by the P.W.A., should be offered these institutions to help them expand to meet the needs. Such a procedure would certainly be less expensive and would impose less tax burden on the taxpayer who is ultimately paying the bill. Hospital care for the indigent and the medically indigent could well be met in these existing hospitals at a per diem rate more cheaply than could be done by building, equipping and running new government hospitals.

Dr. G. Harvey Agnew, President of the American Hospital Association, says: "American medical greatness was built and rests today primarily on private initiative, on privately supported voluntary hospitals and privately supported teaching and research associated with them.

"It is on the voluntary hospitals that our municipal and state hospitals depend for establishment of standards that pave the way to a better future. The voluntary hospital is absolutely essential to the preservation and advancement of high standards in medical practice. Those who wish to preserve the value of private initiative can do so if, like the distinguished benefactors who

have gone before, they help our voluntary hospitals to meet the needs of the future. Outstanding among these is the need to bring good hospital care within the reach of those who earnestly desire to be independent rather than dependent Americans."

When the government proceeds to build hospitals little attention is paid to cost and frequently to needs in the community. An illustration of this is strikingly shown in Hot Springs, New Mexico, which has a population of 300. Here a hospital was built for the care of crippled children of New Mexico at a cost of $2,500,000 with a bed capacity of 90. On one visit to this hospital by a representative of the American Medical Association, 30 beds were occupied by children of New Mexico. Most of the occupants were Mexican children who had been sent from miles away for hospital care. The orthopedic surgeon in charge comes from Texas, 175 miles away, and he receives for his two visits per week to the hospital $2,000 annually more than does the Governor of New Mexico.

At Fort Worth, Texas, the government built a 300 bed hospital for narcotic addicts at a cost of $4,000,000. It is estimated that one can build and equip a good hospital for $4,000 or $5,000 per bed. This one was built at the rate of $13,000 per bed. The committee examined some 14 different sites around Fort Worth and on only one of these sites were they able to find a hill, the only hill in 200 miles. Removal of this hill was the first step in building the hospital. Since it snows only once in four or five years in Fort Worth, it was deemed necessary to connect the building with underground passages to prevent exposure going from one building to another—another economy measure.

The National Health Committee reports that there are approximately 1300 counties in the United States which have no general hospital facilities. Reports of the American College of Surgeons, the American Hospital Association and the American Medical Association show that there are only 13 counties in the United States which are more than 30 miles from a good, general hospital, or speaking in terms of automobiles and good roads, only 40 to 50 minutes, distance.

In eight of these thirteen counties the population is 5 or less per square mile. With good roads and automobiles a distance of 25 to 30 miles from a good hospital is certainly within reasonable access to good hospital care. There is no point in building a hospital where there are not enough people to support it.

The establishment of Diagnostic Clinics in these more sparsely settled communities could be done at much less expense. They would fill the major medical needs of the community by rendering valuable diagnostic aid to the country doctor. Earlier and more accurate diagnoses could be made and hospitalization in many cases could be avoided. The cost of building and operating would be many times less than a new hospital scheme and instead of competing with the existing hospitals they would render valuable assistance.

Some of the objections to State-managed medicine may be summarized as follows:

1. The cost of medical care is increased tremendously. There are frequently as many bureaucratic employees as physicians.
2. Statistics show us that mortality and morbidity rates are increased rather than decreased.
3. Periodic health examinations are not encouraged and immunization campaigns are not emphasized.
4. Emphasis on preventive medicine is not stressed and public health measures are not encouraged.
5. Overmedication, malingering and neuroses are increased.
6. The indigent are not satisfactorily cared for.
7. Post-graduate medical education is not provided for nor encouraged.
8. The hospital load is considerably increased and the practice of medicine by the hospital staff is encouraged.
9. Diagnosis and treatment in the hospital is apt to become mechanical and superficial and of a low order.
10. Medical service soon falls into the hands of the non-medical man and becomes a political issue.
11. The free choice of physician is disturbed and the injection of a third party into the patient-physician relationship is established.

The advocates of Socialized Medicine in this country say that the type of medicine practiced in this country is expensive and

inefficient. In those countries of Europe which have socialized medicine there are as many bureaucratic employees as there are physicians giving medical service. Red tape, government control and political interference take so much of the physician's time that little thought and study can be devoted to the individual patient's illness. The patient ceases to be an individual and becomes a part of mass production. When one is ill one most wants to be an individual.

Those who are advocating State Medicine would have us believe that the standards of medical practice would be elevated and that quackery would be eliminated. Has this been the experience of the countries in Europe which have Socialized Medicine? Germany has had sickness insurance for 54 years. It is admitted that quacks are thriving more in Germany than in any other country in the world. Germany is the only nation which gives official recognition and endorsement to all forms of quackery. Only recently Hitler has expelled 3000 regular physicians from Germany and to take their places he has licensed quacks and faith healers.

In 1912 Lloyd George, in a hard fought political campaign, to win the election, promised complete health protection to all the people. This popular plank in his platform was the means of his election. The British Medical Association bitterly opposed it, but when the association saw that it was inevitable they accepted it and wrote into the law what good features there may be in their system today. This was done over the protest of the politicians.

Until 20 or 25 years ago it was a more or less universally accepted fact that for a doctor to receive a completed, well-rounded medical education he had to go to Europe for one or more years of post-graduate study. What has happened in the last 20 years to change this status of medical education? Has Socialized Medicine had any part to play in this change? Most assuredly it has. In this country medical research, medical education, and independent medical practice have been encouraged by private philanthropy and individual initiative. We have not been handicapped by federal regimentation. Socialized medicine in Europe has lowered medical standards there, while we, in this country, have encouraged individual initiative in medical education and research and elevated our standards and established post-graduate medical education in America. Today the Atlantic Ocean separates us from those who have chosen the path of State Medicine. Let us hope that it will continue to separate us from this monster and that we may continue to point with pride to America as being the center of post-graduate medical education.

Ontario Plan

The Ontario Plan which has been in operation now for four years is of sufficient interest to summarize here. The Province of Ontario entered into agreement with the Medical Society of that Province to provide medical care for their indigent. The plan is briefly as follows: For each person receiving relief, including dependents, (which totaled 400,000) the government agreed to pay 25 cents per month. In return the Medical Association of that Province agreed to furnish for relief-recipients medical services in the office, in the home together with obstetrical home service. Complete freedom of choice of physician prevailed.

The medical profession agreed to charge the regular fee of $2.00 per office visit and $3.00 per house visit and $25.00 for normal labor cases, plus mileage allowance. The medical profession did not expect to collect 100 per cent of these charges. Each bill was checked as to accuracy and fairness by a committee. The total bills were presented each month to the proper designated government authority. The total amount was divided into the amount of the money available for each month. Each doctor was paid according to his account rendered each month. At the end of the two years the government increased the pro rata monthly allowance to relief recipients to 35 cents per month, out of which the druggist was to receive 6 cents.

The records show that the medical profession received 45 per cent of bills rendered the first year, 38 per cent the second year, and 51 per cent the third year. From this we see that the doctors are contributing 50 per cent of the cost of medical service to this group.

After this experiment had been in operation for four years a letter was addressed to the Minister in charge of Health in this Province and his reaction to this experiment asked. His reply was: "So far as the gov-

ernment is concerned, the service is highly satisfactory, the medical profession appears to be doing a splendid piece of work, the relief recipients are satisfied with the care they are receiving and the taxpapers who are providing the funds (over 4 years, approximately four million dollars) are satisfied that they are getting full value for their money."

At no time was there any interference of any kind by the government in this experiment. The experiment demonstrates that the medical profession can render satisfactory medical service to the indigent with complete satisfaction to the patient, government and the doctor.

At the present time there are some 500 to 600 plans for medical care in operation in the United States under the supervision of organized medicine.

If our President, in his re-organization program, should see fit to create a portfolio of Secretary of Health, and appoint a physician to head this department, it is conceivable that the financing of this Health Program, through him and the United Public Health Service, could be accomplished with efficiency and economy. The Secretary of Health would be chairman of the National Health Program. The different states could form their committees with the State Health Officer, who holds his office by the will of the medical profession of his State, as chairman of the State Committee, and ex-officio member of the different county units. The county unit could be represented by the county medical society, local health officer, welfare officer, the mayor, and Chairman of the Board of County Commissioners. The political office-holders would have to be represented because local tax money will be necessary to match the federal funds. This committee could be empowered to employ a welfare worker who would investigate and determine the status of the indigent and would-be indigent and recommend those deserving such for certification, which certification would be for a specified time, not indefinite. This certificate would entitle the holder to call the physician of his choice and would carry the privilege of hospital and medical care by his own physician.

The fee basis is to be worked out by this local committee. The medical society membership would be on call just as they are for any other patient in the community. A plan of payment similar to the Ontario Plan is suggested as a fair and workable one. The doctors would be paid in proportion to the work done and the money allotted in that county for that period.

The medical profession has been accused of being selfish, mercenary, stagnant, and antiquated. We admit that medical ethics by which we are guided are old, but they are the only standards which have stood the test of time. Their principles are as good and as sound today as they were 2000 years ago, when Hippocrates first propounded them. What other profession gives as much of personal service and physical sacrifice as the medical profession? Each day of the year the medical profession gives in free advice and service $1,000,000 and another million at cost or below. How much are these reformers giving or willing to give to the medically indigent of this country? Most of them are after what they can get get out of their scheme, not what they can put into it.

It is incredible ever to think that a layman can measure with any degree of accuracy the value of the elements in the diagnosis and treatment of a sick patient. The only one that has ever been able accurately and impartially to render this service anywhere or at any time is the organized medical profession. When the physician ceases to have complete control as to judgment and treatment of his patient his efficiency is instantly weakened and inferior service inevitably follows.

For the past 2000 years the medical profession has held to this tradition: "That under all circumstances the best possible medical care must be supplied to the public. No matter what obstacles, legislation, pestilence, flood, famine or war may place in the way, the medical profession seeks to adapt itself to the situation and give the best service it can." When we oppose any scheme or plan which makes it difficult or impossible for the doctor to render good medical care, the best he is capable of giving, we are living up to this tradition.

The medical profession in this country has always been equal to the task imposed upon it. I still have faith that if the American Medical Association as an organization is given the opportunity of handling the task of furnishing medical care to all the people

at a price they can meet, it will do a good job with satisfaction to all parties concerned if government interference is withheld.

If the federal government is honestly anxious to see that the medically indigent be given adequate medical care the profession will meet them more than half way. The American Medical Association has already indicated to the Federal Government that organized medicine was glad to consult as to plans and to co-operate as to action to accomplish the goal toward which all of us are striving, that of adequate medical care for all the people.

The existing hospitals as well as the hospitals of tomorrow must provide accommodations within the financial reach of the great majority of our people who want to be self-sustaining. There must be more semi-private rooms to meet this demand. There must be more small private rooms at low cost. It has been the experience of those hospitals fostering this plan that these low cost accommodations have a waiting list and are always in demand. More $4.00 rooms and fewer $6.00 and $8.00 rooms will meet the needs of our people much more satisfactorily. It is and will continue to be our obligation to provide adequate hospital accommodations for those people of moderate and low incomes at a price they can afford to pay.

The time has arrived when the medical profession must assert its leadership in its own household. We cannot sit quietly by and see untrained, unskilled and unscrupulous politicians assume leadership in medical affairs. We will either lead in this campaign or we will be driven as cattle to the slaughter. The demand is imperative and I have all faith that the medical profession will not be found wanting.

The public has been informed by means of the press, the radio, health agencies, and other means of communication that many illnesses can be avoided. They have been informed that by early diagnosis and good medical care many serious illnesses can be prevented. The public wants good medical care while sick but they go one step further and expect us to conserve their health by advising them how to avoid illness. The public must be informed more, and repeatedly, of the advances in preventive medical measures. We should advise the public by every known ethical source that for these measures to be most effective they must be used by the public. Knowledge is of little avail if not put into action.

The National Health Committee has presented a program for *study and action.* It is the duty of the medical profession to *study* its details. What is good and constructive we must endorse and support. The objectionable features we should try to eliminate by suggesting a better plan to which we can subscribe.

The medical profession should admit that all the people are not getting adequate medical care. The financial aid suggested by the National Health Program will be gratefully received by the profession if it would have this help "stand behind the patient, not come between the patient and the doctor." Such a method of procedure can be worked out, I feel sure, with satisfaction to all parties concerned—namely, to the public receiving the service, to the government giving financial aid, and, to the doctor who renders the service.

It is our immediate task to work out ways and means of putting into effect this vast program that is before us. We cannot shirk this responsibility which is ours. With the following ideals before us we shall set about to perform this task:

First, that the standards and quality of medical practice shall not only be maintained but advanced.

Second, that free choice of physician must be maintained as an aid to good medical care.

Third, that we should ever bear in mind that the 'poverty of the patient demands the gratuitous services of physicians.'

Fourth, that it is unprofessional for a physician to dispose of his services under conditions which make it impossible to render adequate medical service.

Fifth, that there shall be no third party in the patient-physician relationship.

I have faith that an effective plan of operation can be worked out by organized medicine, in cooperation with the federal government, by means of which the objectives outlined by the National Health Committee can be attained with satisfaction to the government, organized medicine, and the public.

From the result of these conferences and

plans now in operation will come a better, a stronger and more efficient medical program. Our profession will be bigger, better and stronger than ever before and a medical care program to meet the needs of our people will have been worked out. This plan can and will be worked out by the united effort of our entire medical profession. An appeal for this unity of action and thought is my request.

LEWIS BURGIN McBRAYER AND THE STATE SANATORIUM*

CHAS. H. COCKE, M.D., F.A.C.P.,
ASHEVILLE.

It was with peculiar pleasure, Mr. Chairman, ladies and gentlemen, that I accepted the invitation of your committee to give the first address in a series to be made annually in honor of the late Lewis Burgin McBrayer. I say this honor came to me with unusual pleasure, for my earliest association in the practice of medicine in North Caroline was with Dr. McBrayer. The friendship begun in his private office in Asheville in 1912, while he was a member of the State Board of Medical Examiners and I a candidate for licensure by reciprocity, grew and ripened with the years and lasted until his death. It was cemented by mutuality of interest in tuberculosis work and was kept fresh and green by frequent contacts and meetings. I am not here to recite the many admirable traits and fine characteristics of our friend, Dr. McBrayer —they are known to you all. But one faculty I cannot omit from mentioning, a zest and genius for friendship with his fellow doctors that never wavered nor waned, a personal interest in them that seemed to intensify as he broadened his spheres of activity. By implication, if not by instruction from the Committee, this paper is an attempt at factual presentation. Proper eulogies of Dr. McBrayer have been given elsewhere — notably the recent address by Dr. Paul H. Ringer at the unveiling of the memorial tablet at the Sanatorium.

Briefly, for the record, what is the story of this man? The son of Adolphus and Lou Case McBrayer, he was born in Buncombe County, N. C., December 27, 1868. A student at Judson College, Hendersonville, N. C. in 1883-86, he pursued his medical studies in Kentucky, graduating from the University of Louisville in 1889. The following year he married Miss Lillian Cordie Deaver of Asheville, N. C., of which union there were born three children: Dr. Reuben A. McBrayer, at present medical director of the Ciba Pharmaceutical Products, Inc., Summit, N. J.; Mrs. Sadie L. McCain, wife of our own Paul McCain; and Lewis B. McBrayer, Jr. Twenty-five years of practice in Asheville engaged his energies and time, during which period he served as President of the Buncombe County Medical Society; health officer of the City of Asheville (1910-1914); coroner of Buncombe County (1901-1907); member of the Board of Health, Buncombe County (1909-1914); member of the staff of the Asheville Mission Hospital; member and sometime President of the State Board of Medical Examiners (1908-14); and in 1915 President of the Medical Society of the State of North Carolina.

In 1914 Dr. McBrayer's interest in public health work and preventive medicine led him to accept the superintendency of that struggling and ill-nourished infant institution of the state, the North Carolina Sanatorium for the Treatment of Tuberculosis, located at Sanatorium, N. C., accepting also the next year the position of Managing Director of the North Carolina Tuberculosis Association. Thus he began a concrete effort at mobilizing the state for the fight against tuberculosis, of which, more later!

In 1921 he became Secretary of the State Medical Society, and editor of the Annual Transactions—positions of trust and responsibility which he discharged with energetic zeal and dispatch until only the ravages of increasing ill health caused a discontinuance of his activities in the late months of his life. So abounding a vitality as his, however active these pursuits and positions were, still left him time for interest in other national medical organizations, notably membership in the National Tuberculosis Association and its regional subdivision, the Southern Conference on Tuberculosis, of which he was president in 1925-26; in the American Public Health Association, the Tri-state Medical Association, and the Southern Medical Association, as well as

*L. B. McBrayer Memorial Address delivered before the Medical Society of the State of North Carolina, May 18, 1939.

Fellowship in the American College of Physicians and the American Medical Association. In addition he served as editor of the Section on State Medicine in SOUTHERN MEDICINE & SURGERY in 1920.

Religious and secular affairs also claimed the time and talents of this energetic man. He was a member of the Baptist Church. He early earned a place of prominence in Lodge circles — was Grand Master Grand Lodge I. O. O. F. of North Carolina (1903-04), (grand decoration of Chivalry conferred 1904), Grand Representative from North Carolina of Sovereign Grand Lodge I.O.O.F. 1924, and Grand Marshall Sovereign Grand Lodge 1933-34. He also served as President of the Sandhill Fruit Growers Association in 1922, of the Southern Pines Chamber of Commerce in 1929-30, and of the United States Number One Highway Association in 1931. His busy life ended April 1, 1938 at the home of his daughter, Mrs. P. P. McCain, Sanatorium, N. C.

What of the fruit of these years of unremitting toil and almost ceaseless activity? It is not possible to assess the proper role of one man's activities that have joined the efforts of others seeking the same goal. It is proper, however, to indicate some of the great changes that came about partially as a result of his efforts and interest. Such a statement detracts not one whit from the fair part played by others in these endeavors; and McBrayer would have been the first to acknowledge it, for to him organized effort was part of his creed. And so without invidious reference, what happened to the State Sanatorium and the tuberculosis problem of the state during the term of McBrayer's connection and activities therewith?

First, a bit of history. It was in 1905 that Dr. J. E. Brooks of Greensboro tried to induce the General Assembly to make an appropriation for the establishment of a State Sanatorium; but it was not until the next biennial session in 1907 that with the aid of Dr. J. R. Gordon of Jamestown, then Chairman of the Appropriations Committee in the House, he secured the munificent appropriation of $15,000.00 for the purchase of a site and for the building of a sanatorium, and $5,000.00 for the maintenance of the same. I would have you contrast these figures with the present investment of $2,015,000 in the tuberculosis institution at Sanatorium, while the Western branch of the North Carolina State Sanatorium at Black Mountain, opened November 7, 1937, represents an additional outlay of $967,553.00.

Somehow, someway the infant institution was opened either late in 1908 or early in 1909 with a capacity of thirty-two patients, under the superintendency of Dr. Brooks. After two years of effort under almost insuperable difficulties, medical, political, financial and otherwise, ill health forced Dr. Brooks to retire to private practice, which he resumed in Blowing Rock. But a man of vision had begun a work that was to grow. Dr. Eugene Street succeeded to the superintendency until the middle of 1913, when the institution was closed, and Dr. Street departed. At a special session of the Legislature during the fall of 1913, the control of the Sanatorium was placed in the hands of the State Board of Health. At this special session, tuberculosis was made a reportable disease, the first forward looking step in the control of the disease; and the State Bureau of Tuberculosis was established. The State Board of Health decided to separate the business and medical departments of the Sanatorium, and Dr. Wilson Pendleton was made Medical Director, entering upon his duties in December, 1913, while Mr. Tyree Glenn was made business manager. Cutting the Gordian knot of political, medical and financial troubles that infested the about-to-be-reopened sanatorium proved more difficult and distasteful to one whose training and bent was clinical medicine than Dr. Pendleton cared to cope with, and after three months of service he resigned in February, 1914. After a creditable service in the World War, in which he served as Captain in the Medical Corps, Dr. Pendleton entered private practice in Asheville, where he has been busily engaged ever since. It was into this crisis that Dr. Paul P. McCain was summoned as Medical Director following Dr. Pendleton's resignation. Like his predecessor, before assuming the position, McCain had been assured that the institution was in fine financial fettle, whereas the truth was that it was in most deplorable financial straits. The institution was indebted to so many firms and produce concerns in the immediate section that its credit

had been exhausted to the point where few purchases could be made save for cash. Picture the scene if you can. There were thirty-two patients; there were no electric lights; the accommodations were uncomfortable and inadequate, even for this small group of patients; there was no heat (in February) except from open fireplaces; the institution's credit was exhausted; and it was very difficult to discover just how much it did owe.

Dr. McBrayer came down in April, 1914 to assume his new duties as Director of the Bureau of Tuberculosis. Confronted with the chaotic financial situation in the Sanatorium and the almost hopeless task of making it a going concern, with its inadequate equipment, facilities and means of support, the State Board of Health wisely decided to make its Bureau of Tuberculosis Director also Superintendent of the Sanatorium. Still more wisely they decided to continue Dr. McCain as Chief of the Medical Service, adding to his duties and responsibilities the titles of Assistant Superintendent of the Sanatorium and Assistant Director of the Bureau of Tuberculosis. At last a fumbling Legislature had made a double play that started the tuberculosis team on its successful way as a pennant winner. So widely and favorably known to the profession of the entire state, being President of the North Carolina Medical Society, and likewise well known to so large a portion of the public of the state, Dr. McBrayer's appointment as Superintendent of the Sanatorium was the signal for the prompt re-establishment of confidence in the institution and the restoration of its credit. Brooks Hall, a new building then under construction, was completed and occupied during the same year. Dr. McBrayer assured all creditors of the institution that their accounts would be paid; and so persuasive was he in his appeals to the State Legislature that at the next meeting of the General Assembly not only was an appropriation made to discharge all the accumulated indebtedness of the Sanatorium, but an appropriation providing for seventy additional beds for the institution was also secured — quite an achievement when one remembers the pitiful inadequacy of former state aid. In 1915 Dr. McBrayer became Managing Director of the North Carolina Tuberculosis Association, which Association paid the salary of the late Dr. Joseph L. Spruill, who in 1918 became the first clinic physician. And so, with enthusiastic energy but with considered judgment under McBrayer's leadership, the activities of the State Tuberculosis Association and the facilities of the State Sanatorium expanded steadily.

Realizing the important role of nursing in the treatment of tuberculosis, though not primarily charged with the medical care of the patients, in 1915 Dr. McBrayer established a training school for nurses at the North Carolina State Sanatorium, and served continuously as its dean until his retirement in 1924. In 1923 the negro division of the institution was opened, and now has 250 beds—still sadly in need of augmentation.

In that year the General Assembly relieved the State Board of Health of the management of the Sanatorium, placing it in the hands of a special board of nine members (appointed by the Governor), of which Board Dr. T. W. M. Long was Chairman. Dr. McBrayer resigned as Superintendent of the Sanatorium in 1924.

What had the ten years of McBrayer's incumbency as Superintendent of the Sanatorium brought it? An inadequately constructed, ill-equipped, unheated, and ill-nourished building with 32 beds masquerading as a State Tuberculosis Sanatorium had grown into a 250 bed, modern, well planned, comfortable, efficiently staffed and equipped institution, whose work was becoming known wherever good tuberculosis work was done, a matter of an 800% increase in bed capacity alone. It matters little that Dr. McBrayer never did participate in the actual medical care of the patients. His was the organizing, co-ordinating, enthusiastic leadership that proved how much co-operation between the business and the medical departments of the Sanatorium made for success and enduring results, and above all proved the wisdom of placing the activities of the Sanatorium under one head.

Dr. Paul P. McCain, the present distinguished incumbent, whose work has, while adding to his fame as a phthisiologist of note, likewise reflected deserved recognition upon the institution he heads, succeeded Dr. McBrayer as Superintendent and Medical Director. The Bureau of Tuberculosis of the State Board of Health then became the

Extension Department of the Sanatorium, and McCain was naturally made Director of this. Dr. McBrayer, however, continued his activities as Managing Director of the North Carolina Tuberculosis Association, with headquarters transferred to his home in Southern Pines, until August, 1937, when failing health caused his retirement from this activity. He continued a keen and active interest in the Sanatorium and its Extension Department all through the years after his participation in its active management.

As Managing Director of the North Carolina Tuberculosis Association, he found time for a singularly energetic career. Unfortunately time forbids more than a mere mention of some of the high lights of his accomplishments in that sphere. He remained as Director until within a few months of his death; and though the Association had a board of directors and an executive committee, for all practical purposes he was solely responsible for the activities of the Association. During the earlier years the Association helped buy milk bottling equipment for the Sanatorium, and later assisted in the purchase of the first x-ray equipment. As mentioned earlier, the first Clinic physician, Dr. Spruill, was appointed in 1918, and his salary continued to be paid by the Association until 1924, when this work and the expense thereof were taken over by the Extension Department of the Sanatorium. Employment of the first state public health nurse in North Carolina, the purchase of a moving picture truck for popular instruction and the employment of a negro teacher to visit around the state showing moving pictures and lecturing on subjects pertaining to health, and the employment of both a white and colored health education worker were some of the forward looking activities begun by Dr. McBrayer. The annual double-barred-cross seal sale came up from almost nothing to the fine figure of $40,000.00 during Dr. McBrayer's service.

What was happening to the tuberculosis death rate during this decade of active service when Dr. McBrayer spent so much of his vital energies and efforts in combating disease? In 1915 the death rate from tuberculosis in North Carolina was 156.4 deaths per 100,000 population; while in the year 1924, when he left the sanatorium, it had been reduced to 99.1. These figures are a few points above those for the United States Registration Area for the same dates; but one must remember they were largely augmented by the large number of deaths in the mountain section of the state, which was then enjoying its peak prosperity as a health center by reason of the fame of the doctors then engaged in that special work there. I feel confident that a separation of the deaths legitimately belonging to the citizens of the state from those imported to these health centers would have shown a record equally as fine, if not better than those of the Registration Area. For your interest, though it may seem a bit foreign to the present discussion, this feature of the diminishing death rate from tuberculosis has reached the point where the provisional figures for 1938 would seem to indicate only 53.2, an astonishing drop of two-thirds approximately in the last quarter of a century. These figures for the state are almost identical with the last available figures for the United States Registration Area in 1937, when they stood at 53.6.

It would be profitable, but not germane to this address, to discuss the many factors contributing to this most encouraging fall in the death rate from tuberculosis. It would be foolish to attempt to give Dr. McBrayer too great credit for what is evidently the part of a general trend in this disease; and yet if time allowed I could quote you parallel figures from other communities less active in combating the disease than we have been, showing quite definitely the enormous value of the work done during Dr. McBrayer's active years, and largely under his leadership and guidance.

Of other important activities of the Sanatorium which have grown out of these earlier efforts of McBrayer and his staff much could be said with profit, but that too is another story. What concerns us most here today is that we pay honor to a man who gave up a busy, active practice in his home to attack successfully one of the major social problems of a medical nature of his time. Now why is tuberculosis a social problem? In the first place, the cure of tuberculosis involves an enormous expenditure of money, of time and of effort, and usually involves the temporary sacrifice of

family, friends, ambition and business. For another reason, it attacks the young and those in their most productive periods of life. It tends to disable and to pauperize, and of course by its very expensive and prolonged time for cure lowers the entire family economic level; and so you see it is an economic problem perhaps even before it is a physical one. For cure it means separation from all business and physical activities for quite a long time. The mere physical degree of the disease will, no matter how slight to begin with, eventually become crippling and fatal if unchecked. Years ago Sir Arthur Newsholme pointed out the relation of the incidence of the disease to the living conditions of the population in which it was found; in other words, the lower the economic level and the greater the crowded conditions of living in too intimate quarters, the greater the incidence of the disease. This important factor obtains though there is a wide divergence in the distribution of tuberculosis in various age groups as well as in occupational, income and geographical groups, not to mention the matter of racial distribution. It was a realization of these facts and an appreciation also of the great truth that whatever improves the physical well being and the living conditions and the sanitary surroundings of any person or group of persons, by whatever measures of health activities undertaken, also improves the tuberculosis situation immeasurably that led Dr. McBrayer's interest into wider fields of public health activities than we have time to discuss today.

Almost the whole of the modern effort in attempting to stamp out tuberculosis has been directed along the lines of education and discovery — education of the public to make it aware of the dangers, the prevalence and the pitfalls of tuberculosis and the opportunities afforded for its early discovery, when hopes of arrest and cure are best. The distribution of pamphlets, the presentation of moving pictures, the delivery of lectures and talks—but above all the giving of opportunities for examination to masses of the public by the holding of public clinics, and the splendid work of tuberculin testing in the school and teen ages—are all parts of this campaign, which in this state, as well as in many others, has done much to help uncover and control the disease. It is axiomatic that early and less expensive recovery is almost entirely dependent upon early discovery. The measures I have mentioned followed by the Extension Department of our State Sanatorium may not necessarily all be attributed to the work of Dr. McBrayer; but they stem directly from the central body of his effort, vision and hopes. Had he continued in the superintendency of the State Sanatorium and as Director of its Extension Department, I feel sure his participation in these efforts would likewise have been crowned with the success that marked his other activities. He put his heart, his soul, his mind and the abundant energies of an active body wholeheartedly into this fight, and continued these interests as long as physical strength was given him. That he lived to see the institution which grew so splendidly from its early beginnings reach its present place of dominance* in the successful prosecution of the fight against tuberculosis must have been indeed all the recompense and satisfaction that any man could wish for. That he did this too while serving his fellow man, notably his fellow doctors, in many other valuable capacities is reason for gratitude to him on our part, and that we all pay fitting tribute to a man who was not afraid of work, who loved a problem and a difficulty because of the hope of solution, to a man who sought new pathways and felt that precedents were more to be made than followed when health was to be sought, is but his just due. While doing these things he still had time to leave the impress of his energetic, friendly personality in the hearts of all who knew him. Today we salute his memory and good works.

Ave et vale, dear old friend Mac!

*The present figures represent the facts of today. The main division of the North Carolina Sanatorium is situated on a tract of 2,100 acres, requiring the services of a farming superintendent, his assistants, a dairyman and a poultryman. Total bed capacity today is 550; but the 75 beds soon to be added to the colored unit, including 25 at the prison building, bring the total capacity to 625. The medical staff consists of the superintendent, four white assistant physicians, three colored physicians for the colored division, from one to four interns, and a dentist who divides his time with the Western Carolina Sanatorium. The nursing staff consists of eleven white and six colored graduates, including the white and colored superintendent of nurses, while the training school is composed of thirty white and twenty colored pupil nurses. Four clinic physicians conduct diagnostic clinics over the state. The Western North Carolina Sanatorium is located twelve miles east of Asheville on an undeveloped farm of 183 acres; and the present plant consists

of the administration building, power house, patients' quarters, white and colored cottages, with a present capacity of 300 beds, all for white, 30 beds in one section intended for patients being used to house nurses. The nursing force consists of a superintendent of nurses, operating room supervisor, eleven graduate, four two-year graduates, and fifteen practical nurses, while the medical staff consists of the Medical Director, one resident and two assistant physicians.

PNEUMOCONIOSIS*

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Within the past decade it is probable that no other pathological entity has received such widespread interest—one might almost say, "publicity"—as has the subject of this discussion, pneumoconiosis. Not only has it received the attention of the medical profession but it has aroused the interest of our legal brethren, of industrial management, of organized labor, of our law makers and our law courts. Even the sob-sisters have taken a turn at it. It has literally burst upon our general social consciousness in these past ten years. Probably, also, there has been no other medical subject which has been the object of such confusion of thought and about which there has been disseminated so much misinformation as this same pneumoconiosis.

Not that it is a new, or even a newly discovered, disease. Pliny recognized it and reported its existence as early as 76 A.D. But workers in heavily dusty trades were few in those days and the first attempt at description came post humously from the pen of Agricola in 1556. It remained for the machine age, however, and more particularly for modern industrialization, to enter the picture and by producing dusts in previously-unheard-of concentration cause a serious hazard to the health of workmen. A growing social consciousness plus the explosive effect of the economic depression with its unemployment focused the attention of both medical and non-medical thought upon this peculiar industrial medical problem.

The term *pneumoconiosis* has come to be ambiguous and should be discarded. It was coined to refer to a disease of the lungs due to the inhalation of stone dust. Literally, and in its most generic sense, it means "a condition in which stone dust (inorganic dust) is in the lung." In this sense we all have pneumoconiosis to a greater or less degree. Its presence is as inevitable in modern life as any other aging process—such as graying hair.

There are as many *kinds* of pneumoconiosis as there are *kinds* of *inorganic dust*, e.g. iron — siderosis, carbon — anthracosis, silica — silicosis, asbestos — asbestosis, etc. But only two known dusts have proven to be capable of causing any significant pathological change in the tissues of the lung, namely, free silica and asbestos which is a fibrous silicate. Consequently from all clinical points of view the discussion of pneumoconiosis can be limited to these two specific varieties, *silicosis* and *asbestosis*. All others are of academic interest only at present. Certain others are under suspicion but no true indictment has been rendered. Nor does it seem likely that it will be in view of past experience. Other dusts, such as granite, have been indicted in the past but in each case the substance responsible for the pulmonary pathology was found to be the free silica present, mixed with the silicate, rather than the silicate itself. Of the two, silicosis and asbestosis, silicosis is far more important because of the number of men involved.

The definition of silicosis is both an etiological and descriptive one. "Silicosis is a condition in which abnormal fibrosis occurs in the lung due to the inhalation of finely divided free silica."

The mere presence of particles of silica in the inspired air is not sufficient to produce a silicosis hazard. Many other supplementary factors enter into the etiology. The most important of these are the size of the particles, the concentration or number of the particles, the length of exposure, the influence of other coincidental dusts, and finally the individual variation of the worker in response to the dust.

As to the size of the dust particles, only those of less than 10 microns in size need receive our consideration. Larger particles are not respirable into the air cells of the lungs. With particles of less than 10 microns in size it may be said that the smaller the particle the greater its toxic effect.

Equally important with the size of the particle is the number of particles present

*Discussion presented at the Symposium on Diseases of the Chest at Duke University, October 19, 1939.

in the air. In human evolution man was equipped with defensive mechanisms adequate to protect him from any untoward effect due to a reasonable amount of inhaled dust. Modern industrialization has upset this balance. The lower border line of safety has been arbitrarily set at 5,000,000 particles per cubic foot of air, for pure silica. Concentrations greater than that figure are presumed to be hazardous.

Just as the body defenses can handle relatively small amounts of dust successfully for a lifetime, so are they able to handle large amounts for short intervals. The length of exposure is an important factor in the production of silicotic fibrosis. Even in the worst conceivable working conditions it requires two to three years before the lesions characteristic of silicosis can be demonstrated. In lesser concentrations, especially if the silica is mixed with other dusts, it may require 20-25 years of constant exposure before any pathological change can be detected.

Other dusts mixed with the silica may greatly influence the rate and degree, and somewhat the architectural character of the pulmonary fibrosis. Pure silica alone has so far proven the most productive of pathological change. In general it is a safe rule that mixtures of other dusts tend to inhibit the rate of fibrosis.

Individual variation in response to dust is a most intangible factor. It must be a very real one, however, for we have no other explanation for the fact that not all workmen exposed to the same hazard develop silicosis at the same rate or to the same degree. Many go completely unscathed.

Where do silicosis hazards occur? How widely are they distributed, and how many men are involved? There is a potential silicosis hazard in every industrial operation that releases a sufficient amount of sufficiently fine silica dust into the atmosphere. A few of the more common hazardous occupations in the recent past have been sand blasting, stone cutting, sand pulverizing, all hard rock drilling whether in mines or elsewhere, ceramics, abrasives manufacture, and foundries.

It has been estimated that, of the present generation of American workmen, approximately 500,000 have had significant exposure to silica dust. We do not know how many of these have contracted silicosis. However from the surveys made of representative industries it is safe to assume that only 1/5 to 1/4 of the total will show any silicosis whatever—a round number of perhaps 120,000. Experience in the same representative industries shows that only a minority of those showing x-ray evidence of silicosis suffer disability as a result. That leaves us a much smaller number, probably only a few thousand, potentially symptomatic silicotics. The remaining majority would have lived out their allotted span undiagnosed had not the surveys been carried out.

A brief review of the pathogenesis and pathology of this condition is indispensable to an understanding of its subclassifications, each with a characteristic x-ray pattern, and therefore to the diagnosis. As will be pointed out later the major crux in diagnosis lies in the x-ray, and an intelligent interpretation of the shadows seen depends upon an understanding of the pathological conditions which these shadows reveal.

We recall that the lung, anatomically, can be roughly likened to a tree, the trunk of which is represented by the trachea, and the individual leaves correspond to the individual air sacs, or alveolae. The entire parenchyma is abundantly supplied with lymph spaces which open into lymph channels. Those near any of the surfaces drain into the subpleural channels which course circumferentially to the hilum. All others drain toward the hilum and are intimately associated with the branches of the pulmonary vessels.

When dusty air is inhaled a considerable number of the particles are screened out by the gross mechanisms of the nasal passages, the moist trachea and larger bronchi. However, this is not adequate to remove all the particles in atmospheric suspension, and many reach the alveolae. Of those which do enter a few will adhere to the walls of the air cells. Here they are picked up by wandering phagocytes which then return to tissue spaces and start making their way into the lymph channels on a general migration toward the hilum, many actually reaching the peribronchial and tracheo-bronchial lymph nodes. Many will be trapped in the tiny aggregations of lymph tissue which lie along the course of the lymph channels. As this trapping and retention of dust-laden cells continues there will come a time when

the total effect of these accumulated deposits will actually increase the diameter of the relatively radio-opaque vascular sheath. This in turn is caught on the roentgenogram as an exaggeration of the normal linear markings which represent the vascular tree. These same deposits subpleurally give the lung surface its pigmentation, particularly if the particles be carbon.

If the dusts inhaled are inert, such as gypsum, cement, marble, carbon, etc., no further development occurs. Sections of the lung merely reveal continuous little ash heaps of dust-bearing cells along the course of the perivascular lymphatics. The surrounding tissues are not stimulated to fibrosis formation and there is apparently no interference with normal pulmonary physiology. As has already been stated this condition, when sufficiently well developed, registers on the x-ray film and has been variously recorded as "perivascular infiltration", "perilymphatic infiltration", "exaggeration of the linear markings", and most unfortunately as "more fibrosis than usual".

While this last term was coined several years ago by the Miner Phthisis Medicolegal Bureau of South Africa to apply to this variation in the x-ray appearance of healthy lungs, the inclusion of the word "fibrosis" has caused no end of confusion not only in the minds of the medical men but in the courts. The word *"fibrosis"* carries the implication of tissue reaction — a definite pathological process — and we now know from microscopic studies that fibrosis is either insignificant or wholly absent. Many cases have been mistakenly labeled silicosis, and so taken to the compensation courts with nothing more than this innocuous linear exaggeration in the x-rays.

Such films are not even pathognomonic of dust deposits. Any alteration within the lung that will increase the caliber or density of the vascular sheaths will duplicate this pattern in the roentgenogram. Among such conditions are pulmonary arteriosclerosis; chronic bronchitis with peribronchitis; pulmonary congestion due to failing circulation. Of course, with chronic infections and conditions impairing the oxygenation of the tissues some fibrosis may be present.

When large amounts of silica enter the scene the picture changes. When large numbers of cells bearing silica particles come to rest in a given area they eventually stimulate the adjacent tissue to the formation of fibrosis. Each aggregate of particles acts as a focus and gradually a concentrically increasing nodule of fibrous tissue is built up about this center. Soon, pathologically, the finer lymph channels become partially occluded so that the central migration of the wandering dust cells is impeded and some of them delay in the extra vascular parenchyma long enough to become foci of fibrosis there. Hence occurs the simultaneous appearance of discreet nodules uniformly dispersed throughout the lung fields. The silicotic nodule is characteristic. It is firm, sharply outlined, without a peripheral inflammatory zone, and is composed of whorls of fibrous tissue which hyalinize. These then are the characteristic pathological lesions of silicosis—innumerable, discreet, sharply outlined nodules—which transmit their number, distribution, shape and definition to the x-ray film.

This is briefly the picture of *Simple, or Uncomplicated, Nodular Silicosis*—the classification that embraces the great majority of all cases. This is further divided into arbitrary stages—first, second, and third, depending on the size of the nodular shadows. Stage I may be roughly described as any nodulation visible on the x-ray film up to those 2 mm. in diameter, and Stage III as that stage in which the nodules have become so large that some are on the point of being contiguous. In these more advanced stages there will be seen compensatory emphysema at the lung bases and peripherally.

In contrast with the *Simple Nodular Silicosis* we have a group of cases designated as *Silicosis with Massive or Conglomerate Shadows.* The roentgenograms of these cases show a background of the characteristic nodulation with localized massive or conglomerate densities. These may be but small conglomerations of nodules still recognizable as such, but packed together in one locality and more numerous and larger than the nodules elsewhere. All gradations occur between this small localization and huge uniform opacities occupying the greater portion of both lung fields, and so dense that all architecture has been lost. These latter are accompanied by extreme basal and peripheral emphysema.

Microscopically the typical nodules are still recognizable here and there in the more massive lesions but have now become so firmly imbedded in a matrix of general fibrosis that they have become an integral part of a hard, hyalinized fibrous area. In the less compact lesions and the small areas of conglomeration the nodules dominate the microscopic picture, being merely bound together and more or less integrated by fibrous strands.

The complete etiology is not clear for all of these conglomerate and massive lesions. In Saranac Lake we agree with Dr. L. U. Gardner that the most likely explanation for their existence lies in the combined action of silicotic fibrosis and infection. It is true that in some of the more massive lesions no histologic evidence of infection can be found, but in the majority of them and in practically all of the less massive and smaller conglomerations elements of infection are discovered. This conclusion is further supported by the fact that we have observed such lesions later break down with unmistakable progressive infection when followed with serial films. In those cases where no evidence of coexistent infection occurs, we presume, rightly or wrongly, that the peculiarities of the lesion were brought about by a previous infection which had long since burnt itself out. Animal experimentation also supports this theory.

The third and last group of silicotics are those classed as *Silicosis with Infection* or *Infected Silicosis.* As the previous comments would indicate this group overlaps and embraces many, if not all, of the cases classed as *Conglomerate Silicosis.* When recognizable antemortem infection occurs, it is almost invariably tuberculosis. The background of diffuse silicotic nodules is present, as always. The roentgenographic appearance reflects the pathology within the lung. The most important criterion is the appearance of ill defined shadows in contrast to the sharply limited shadows cast by uninfected silicotic nodules. This may vary in all gradations from a small barely discernible localized smudge to a state in which an overwhelming progressive bilateral tuberculosis has completely blotted out the original pattern of nodulation. As the individual nodules themselves become the site of infection their sharp edges lose their definition and blurr off insensibly into the surrounding healthy lung pattern. In those unusual cases in which an overwhelming exogenus tuberculosis supervenes on the background of an established silicosis all the nodules appear to blossom simultaneously.

The clinical picture of silicosis can be quickly summarized. In contrast to most pathological entities, silicosis presents no pathognomonic syndrome, no characteristic symptom complex. It is true that we read of the fixed chest, the dyspnoea, the chest pain, the sputum—scanty, glassy and blood tinged, or copious and mucopurulent. Among the physical signs we are told of limited chest expansion, cyanosis, hyperresonance, prolonged and suppressed breath sounds, clubbed fingers, a various assortment of rales. But these same symptoms and signs are, individually and in groups, found to belong to other conditions and in individuals in whom no suspicion of silicosis can exist. It is the writer's firm belief that silicosis remains symptom-free until some complication develops. The possible exception to this generality is that a simple uncomplicated silicotic may become so far advanced that the accompanying emphysema may handicap him. Even that might come under the heading of complications without stretching the point too far. In those cases which do become symptomatic the onset of symptoms is so insidious that it has been stated that the first symptom is a decrease in the pay check of the piece-worker — due to his slowing down in working efficiency.

To clarify this problem in my own mind I have divided all silicotics into two groups or two stages: the first, *Preclinical or Asymptomatic Silicosis;* the second, *Clinical* or *Symptomatic Silicosis.* Again quoting the estimates given earlier there will be approximately 100,000 in the first group and a very much smaller number in the second. In this latter or symptomatic group will be: first, those extremely far advanced cases of simple silicosis with disabling emphysema; second, those with active infection; and third, a group with cardiovascular disorders in whom pulmonary fibrosis creates an additional handicap. The symptoms and signs will be those inherent in the complication, whether emphysema, pulmonary infection or an embarrassed circulation.

Silicosis can not be diagnosed from the

clinical picture. At most it can be suspected if the afore-mentioned complications occur in more than their normal frequency among a group of workmen exposed to a siliceous dust, and a thorough investigation should follow. There are two indispensable criteria in the diagnosis of silicosis, and only two. They must both be present for the same individual before such diagnosis is permissible. These are, first, a *history* of *significant exposure,* and second, an x-ray bearing the *characteristic nodular pattern* in the lung fields. One without the other is not enough. There are occasionally other conditions which simulate the x-ray pattern of silicosis so well that diagnoses of silicosis have been made in men who were never exposed. And, on the other hand, men have also received the same diagnosis simply because they worked in a siliceous dust irrespective of the fact that their lungs showed nothing in the roentgenogram. We know that many men so exposed escape unscathed.

The course of silicosis is that of extremely slow progression pathologically if the individual remains exposed to the harmful dust. The progression is to be measured in years rather than months, and in the majority of cases will not become symptomatic within an average lifetime unless complications supervene.

The progress depends on the complications. Silicosis *per se* is not a fatal disease. In considering those cases complicated by cardiovascular disorder we must remember that these men are usually in the age-group subject to the degenerative cardiovascular disease by the time they acquire their silicosis. We have seen several cases with massive conglomerate lesions who have died of congestive heart failure. By far the most important complication is tuberculosis. Were it not for tuberculosis, silicosis would be a relatively negligible condition.

Tuberculo-silicosis is a large subject by itself. Suffice it to say here that silicosis definitely predisposes to tuberculosis and that when active tuberculosis becomes established in a silicotic individual the prognosis is much more unfavorable than in the non-silicotic. Also the majority of the tuberculo-silicotic individuals pass through a long chronic period of very low toxicity before the infection becomes evident, so that the tuberculosis is very likely to become well advanced before it is suspected. Every silicotic individual with localized shadows in the lung fields should be re-x-rayed at frequent intervals in spite of his protestations of perfect health. In no other way will the early progression of his infection be detected in time for him to enjoy a normal life expectancy.

No discussion of this general topic of pneumoconiosis would be complete without further mention of asbestosis, especially here in North Carolina where many of our important American contributions to the subject have originated. While silicosis and asbestosis are both fundamentally conditions of abnormal pulmonary fibrosis, they differ widely in their pathogenesis, pathology, and clinical pictures. The particulate fibers of asbestos are too long to be taken into the alveoli of the lungs. They are picked up in the terminal bronchioles and become imbedded in the walls of these structures. Here they stimulate fibrous tissue reaction and the result is a fibrous cuff encircling the bronchiole, thickening the parenchymal wall, and partially stenosing the air passage. In far advanced cases the stenosis is sufficient to cause miliary atelectasis beyond the point of constriction and miliary emphysema of adjacent unaffected areas. All these factors contribute to an embarrassment of the respiratory and circulatory functions. Adhesive pleuritis is common and extensive pleuropericardial adhesions lead to the so-called "porcupine heart" shadow seen in the x-rays of far advanced cases. The roentgenogram bears no resemblance to that of silicosis. A general haziness or so-called "ground glass" appearance prevails, more prominently in the lower half of the lung fields, together with the aforementioned evidence of adhesive pleuritis. On close examination of the films, particularly in stereo, this ground glass appearance resolves itself into a delicate reticulum of faint shadows, produced as the natural consequence of the thickened pulmonary stroma.

This peculiar distribution of pathological fibrosis accounts for the fact that the victim develops dyspnoea comparatively early and that a considerable number of the advanced cases are reported to show right-sided cardiac enlargement and clubbed fingers. In the presence of organic heart disease of any sort the outcome is obvious. American ex-

perience does not indicate that asbestosis predisposes to tuberculosis, in contrast to the opinion in England. The clinical difference between silicosis and asbestosis is as marked as their pathological difference.

In dealing with silicosis the examiner is astonished that men who show lungs studded with silicotic nodules should refuse to admit symptoms, while with asbestosis he is equally astonished that men with so little to see in the x-ray should experience a definite physical handicap.

There are still many gaps in our knowledge of these individual pulmonary fibroses. Our first clinical impressions were derived from observations on the poor tuberculosilicotics who waited their end in our alms houses, hospitals and sanatoria. Our first knowledge of the pathology came from observations made upon the same cases after the end had come. But these were all readings made from the last chapter of the book. These studies were later supplemented by some insight into pathogenesis as discovered by the experimental pathologist in his animals. This gave us a sort of beginning to the story of which we had already seen the end. When health surveys began to be made in industry we were appalled by the number of men showing dust fibrosis and jumped to the conclusion that these thousands upon thousands were all destined to cough their lives away as had their predecessors in the alms houses. No wonder there was hysteria and panic in industrial medicine and in industry itself. Further animal experimentation, more comprehensive health surveys, longer periods of observation of men by serial x-rays and more sober consideration of the available facts have led to a revaluation of the whole problem and the hysteria is dying a natural death. Within another generation the major industries will have removed the hazards by mechanical means. But we still have the present generation of silicotics to consider. We still need to know: how rapidly nodulation progresses when once established; what is the threshold exposure beyond which silicosis will become self progressive even though further exposure is removed; what percentage of the preclinical silicotics now in existence will develop complications and become disabled; how we can diagnose the infected case earlier; how we can best treat him, and many other pertinent facts.

The experimental pathologist, the biochemist, the industrial physician and the governmental health agencies are all doing their part in attacking this problem. But there is a definite and important part that can be played by the practitioner better than by anyone else. He can do a great deal to help identify silicosis hazards and run them down in unsuspected places. He already has the confidence of the workmen and his family and can use his influence in getting x-rays and other examinations of employees in small industries and individual enterprises in which there is some suspicion of a silica hazard. Equally as important as diagnosing silicosis where it exists is the prevention of its diagnosis where it does not exist. Thus he may save mental anguish, litigation and injustices to both employer and employee.

THE VARIOUS FORMS OF ENCEPHALITIS*

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It is essential to have clearly in mind some idea of the various forms of encephalitis for purposes of both diagnosis and treatment. In the minds of most practitioners, and indeed of some neurologists, encephalitis comprises a more or less indistinct group of entities, poorly-defined pathologically and clinically. While there is some ground for this belief, the fact remains that what is known constitutes a good basis for a clinical grouping of a much confused problem. Furthermore, a knowledge of encephalitis in its various forms tends to clear the mists from the generic diagnosis "encephalitis", which more often implies ignorance of the diagnosis than a knowledge of encephalitis. It is wise to avoid the use of the term "encephalitis" as a diagnosis by exclusion, and to know exactly what form of encephalitis is meant. In this way many of the pitfalls which accompany the diagnosis may be avoided; for too often the diagnosis of encephalitis is made without any knowledge concerning the type with which one deals.

*From the Department of Neurology, Jefferson Medical College, Philadelphia.
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It is primarily for this reason that I feel it wise to discuss a much belabored subject. My object is threefold: (1) to point out the various forms of encephalitis as a background for a working knowledge of the subject, (2) to emphasize the fact that a diagnosis of encephalitis by exclusion should be avoided, and (3) to point out that if a diagnosis of encephalitis is made, it should be made with a full knowledge of the specific type of encephalitis with which one is faced.

Classification.

There are many classifications of the encephalitides. All of them are based on neuropathological studies. Some are too inclusive, others are too exclusive.

For purposes of simplification I shall define encephalitis as a disease of the brain characterized by evidences of inflammation, the term "inflammation" being used in a broad sense. This is a definition largely from the standpoint of the neuropathologist. Clinically speaking, encephalitis is any inflammatory disease involving the brain. Such a definition would include many forms of meningo-encephalitis, such as general paresis, tuberculous meningo-encephalitis and other disorders; hence I shall confine myself to a narrower concept of the encephalitides, granting of course that in the strict sense of the word the various forms of meningo-encephalitis should be included.

For purposes of discussion the following grouping of the various forms of encephalitis seems best:

1. Polioencephalitis
2. Metastatic Encephalitis
3. Acute Demyelinizing Encephalitis
4. Chronic Demyelinizing Encephalitis
5. Perivenous Encephalitis
6. Hemorrhagic Encephalitis
7. Miscellaneous Types of Encephalitis.

This grouping includes all the important forms of encephalitis, and excludes others which are not absolutely essential to the discussion.

Polioencephalitis.

The polioencephalitic form of encephalitis is frequently referred to as the polioclastic variety or the patchy type of encephalitis. It includes a number of conditions such as pollomyelitis, epidemic encephalitis, herpes zoster, and rabies. These diseases are grouped together under the term polioencephalitis because from the pathological standpoint they have the characteristic of attacking the gray substance of the brain and spinal cord in varying degree. The classification is based on pathological characteristics; it by no means implies that all these diseases have a similar etiology.

The various diseases grouped under polioencephalitis have similar histological features; so much so that without previous knowledge of the history it is impossible from their histological features to differentiate one from the other. They differ largely in the locus of the disease process and in their mode of access to the nervous system. Poliomyelitis, for example, involves primarily the anterior horn cells of the spinal cord, but it may, and often does extend to the gray matter of the medulla, pons, midbrain, and diencephalon; or it may even involve the cerebral cortex, particularly the motor cortex. It may at times affect only the base of the brain without disease of the spinal cord. Epidemic encephalitis, on the other hand, is prone to attack the midbrain, especially the region around the aqueduct of Sylvius; it may extend into the pons and diencephalon or the basal ganglia, and it may on rare occasions involve the spinal cord. Rabies affects primarily the base of the brain, especially the medulla, but extends eventually into the spinal cord also. While the histopathology of rabies is similar to that of other members of this group, it may be distinguished definitely by the presence of Negri bodies in the diseased ganglion cells. Herpes zoster, the other of this group, involves primarily the posterior root ganglia, and the posterior horns of the spinal cord. It may, however, give rise to a typical encephalitis associated with herpes ophthalmicus involving the first division of the trigeminal nerve. Herpes encephalitis cannot be distinguished microscopically from epidemic encephalitis.

The grouping of poliomyelitis, epidemic encephalitis, rabies, and herpes zoster forms a convenient method of allying these important forms of encephalitis based on the similarity of their microscopic features. It tells us nothing concerning their etiology, and but little about their pathogenesis. In a very wide sense it is a grouping of convenience both for the pathologist and for the clinician.

While the various members of the polio-

encephalitis group have a similar histology, their pathogenesis differs widely. Poliomyelitis enters the nervous system through the olfactory nerve and tracts, and extends into the brain and spinal cord by way of the hypothalamus and other parts of the brain stem. Rabies invades the nervous system by means of injection through a bite. The mode of entrance of herpes zoster and epidemic encephalitis is not known. If any conclusion can be drawn concerning the histological similarity of poliomyelitis, epidemic encephalitis, herpes zoster, and rabies, it is simply that they are probably all virus diseases. The evidence is good for poliomyelitis, herpes zoster, and rabies, and is fairly conclusive for epidemic encephalitis.

It would take me too far afield to discuss even briefly the clinical features of the various members of this group, so that I must be content merely to call attention to their histological similarity in the hope that such a grouping may serve to throw some light on clinical problems.

Included in this group of encephalitides are two special forms of encephalitis known as the St. Louis type encephalitis and Japanese B encephalitis. Japanese encephalitis has been known for several years, the disease occurring in epidemic form during the hot season. The St. Louis type of encephalitis is somewhat similar clinically to the Japanese type. The clinical manifestations vary greatly, and include meningeal signs — confusion, diplopia, sleeplessness — and other evidences of brain stem involvement. The disease is caused by a virus, has a mortality of only 20 per cent, and differs etiologically from the virus of Japanese encephalitis. The two viruses are not identical. Pathologically, St. Louis encephalitis is characterized by foci of lymphocytic infiltration in the tissue, with perivascular infiltration and with much more extensive involvement of the nervous system than in lethargic encephalitis, the damage involving the cortex and other parts of the brain in addition to the brain stem.

Metastatic Encephalitis.

The group of cases included under the term metastatic encephalitis constitute a very important clinical group. They form a group of encephalitis from various causes with a similar histological picture. They are spoken of as cases of metastatic encephalitis because the encephalitis which is found in such instances is the result of foci elsewhere in the body. This form of encephalitis consists of foci which may attack any part of the brain or brain stem. They rarely involve the spinal cord. They have a predilection for the gray matter, but they may affect also the white substance to a much lesser degree. The nervous system in such cases is spattered with discrete foci which may be numerous or may be quite few in number. I have seen brains riddled with such foci, while in other instances I have had to search carefully for a few areas at the base of the brain. Histologically, the foci are composed usually of discrete collections of polynuclear cells in the gray substance, with extension of the exudate into the surrounding tissue and with peri-vascular infiltrations with polynuclear cells. There is usually no meningeal reaction unless one of the foci lies adjacent to the subarachnoid space. Essentially the process may be described as miliary abscesses. Strictly speaking it is an encephalitis. In some instances this form of encephalitis is associated not with polynuclear infiltrations, but with punctate hemorrhages.

Clinically, metastatic encephalitis may arise from cardiac disease, lung abscess, septicemias, tooth extractions and bronchiectasis. In heart disease it is most often found as a complication of subacute bacterial endocarditis, but it may occur also during the course of rheumatic endocarditis. In cases of subacute bacterial endocarditis the metastatic encephalitis is often terminal, but not necessarily fatal. Cases not infrequently recover if the extension is not too severe. The onset of cerebral symptoms in such cases is sudden and apoplectic, and may or may not be associated with fever. The signs vary with the particular area involved. Similar encephalitic manifestations occur during the course of septicemias from various causes, and here the matter is one largely of academic interest; though in these days of chemotherapy even some of these may recover.

Particularly instructive are the cases of metastatic encephalitis which develop after the extraction of abscessed teeth. Several instances of this sort have been recorded. I myself have seen and studied five. The encephalitis in such cases follows soon after

tooth extraction, is sudden and abrupt in onset, associated with fever, and may produce monoplegias, focal convulsions, or other signs of cerebral damage. The encephalitis in such cases may be part of a blood stream infection, in which case the outlook is poor, or it may a focal manifestation with full recovery.

It is not uncommon to see cerebral complications accompanying lung abscess or bronchiectasis. Such complications consist usually of brain abscess, but a metastatic encephalitis is also not infrequently found. The differentiation between the two conditions is often very difficult in the acute stages. They may both give rise to focal signs, such as focal convulsions, aphasia, or hemiplegia, but the cases of metastatic encephalitis usually show no signs of increased pressure and no increase of cells in the spinal fluid. Cases of this sort which recover from their cerebral symptoms may, of course, be attributed to encephalitis rather than abscess.

Acute Demyelinizing Encephalitis.

In this group one finds largely the cases of acute encephalomyelitis disseminata and equine encephalomyelitis. This is a disorder characterized by patchy disseminated areas of tissue destruction. They may involve the brain and brain stem and the spinal cord; they may be confined to the brain and brain stem; or they may implicate the spinal cord predominantly. The areas of encephalomyelitis involve both the gray and white matter, but show a preference for the latter. Their number varies greatly; they may be numerous or few. Histologically, they are characterized by destruction of the tissue in discrete patchy areas, with loss of myelin, axis cylinders, and active phagocyte activity. The vessels both within and around the areas of destruction often show perivascular infiltration with lymphocytes and plasma cells.

Clinically, disseminated encephalomyelitis often follows upper respiratory infection, and is characterized by an abrupt onset, fever, and varied clinical signs depending on the areas involved. Paralysis of one side, of the legs, or of all the extremities, a sensory level, bladder and rectal disturbances, and cranial nerve signs may be found in varying combinations. Usually there is a leucocytosis. The spinal fluid may show an increase of cells if the patient is studied in the acute stage of the disease. The cause is unknown. The disease has been reported after influenza and the grippe. It is regarded as a virus infection, though no good evidence has been put forward to support this conception.

Recent years have revealed a new form of acute encephalitis. This is an equine encephalomyelitis which has been found to appear in man in epidemic form in the eastern and western parts of the United States. It is divided into the eastern and western forms of equine encephalomyelitis in man, because of differences which occur in the two forms. The virus of the eastern form differs serologically from that of the western type. Both types are characterized by diffuse necrotic foci with inflammatory and degenerative lesions. The clinical onset is abrupt with high fever and severe prostration, with a preponderance of polynuclear cells in the spinal fluid. The mortality in the eastern group is high (65 per cent). In 8 fatal faces a virus was isolated from the brain tissue, but the virus was not found to be the same in all instances. Five different types of virus have been recovered. A mosquito vector is said to carry the disease. A virus has been recovered from human blood serum in the western type of equine encephalomyelitis. There is also a Venezuelan and Argentinian form of equine encephalomyelitis, but so far no cases have been recorded in human beings. These forms of equine encephalomyelitis appear to be different from the American types.

Chronic Demyelinizing Encephalitis.

In this group of encephalitides may be included multiple sclerosis, encephalitis periaxialis diffusa (Schilder's disease), neuromyelitis optica (Devic's disease), and a rare form of enchephalitis, the enchephalitis concentrica of Balo.

Multiple sclerosis is well known and needs no extensive comment. In a broad sense it may be included among the encephalitides, since it has many of the features of encephalitis. It is a chronic demyelinizing disease characterized by areas of tissue destruction involving the spinal cord, brain stem, cortex, and optic nerves and tracts. It is characterized histologically by destruction of myelin in the affected areas, the relative preservation of the axis cylinders, and the formation of glial scars. The etiology is unknown. The

present day conception is that the patches of multiple sclerosis result from vascular occlusions from causes unknown; the specific etiology still remains unsolved. Recent studies seem to indicate that occlusion of vessels by thrombus formation precedes the formation of the multiple sclerotic patches. Still another concept regards multiple sclerosis as being due to myelin destruction from lipase ferments in the blood stream. By some it is believed to be a spirochete infection, and by others to be a virus disease.

Encephalitis periaxialis diffusa, or Schilder's disease, is an extensive demyelinizing process characterized by the destruction of myelin with the preservation of axis cylinders. The disease involves entire lobes of the brain. Infiltration with lymphocytes in the areas of destruction as well as around the vessels is often seen. Glial scar formation develops later. The short arcuate fibres connecting adjacent cortical gyri are often preserved. The demyelinized areas involve the occipital lobes symmeterically, and may extend forward into other parts of the brain, or they may involve primarily the frontal areas. The disease occurs usually in children, is characterized by a slow, gradual onset, with blindness, often with convulsions, and with mental deficiency.

Allied to this group of encephalitides is a disorder recently described as neuromyelitis optica (Devic's disease). This disease is characterized by optic neuritis and subjective visual complaints, associated with signs of involvement in other parts of the nervous system. Many investigators regard it as a form of multiple sclerosis.

Perivenous Encephalitis.

A particularly important group is the perivenous enchephalitis, which is classified by some with the acute demyelinizing encephalitides. It is better classified as a separate group both clinically and histologically. This group of cases is characterized by diffuse small areas of encephalitis scattered throughout the brain substance, involving chiefly the white matter of the cerebral hemispheres, the internal capsules, and the white matter in the base of the brain. The cortical gray matter is involved to a lesser degree. The encephalitic areas show demyelination around the venules, with destruction of both the myelin and axis cylinders, and with perivascular infiltration consisting chiefly of glial cells.

This form of encephalitis has been found to occur following vaccination, measles, German measles, pertussis, chicken pox, small pox, and mumps. Cases following vaccinia have been few in this country, but were extremely numerous in Holland, England, and Germany a few years ago. The enchephalitis in these cases is accompanied by a secondary rise in temperature, and by varied clinical signs. There may be an onset with convulsions, with hypersomnolence and cranial nerve paralyses, (abducens or oculomotor paralyses), or with weakness of one or more limbs. The mortality in vaccinial encephalitis is high (30-40 per cent), in measles low (10-15 per cent). The encephalitic sequelae in measles are apt to be quite high, especially in some epidemics. The mortality and sequelae following chicken pox are slight. Nervous complications may occur about twelve days after vaccination, about six days after eruption in chicken pox, about three to six days after the eruption in measles, and on the third or fourth day, in German measles. The neurologic signs in encephalitis following German measles include headache, neck stiffness, attacks of unconsciousness, and mental confusion. The cell count of the spinal fluid is increased (10-200 lymphocytes).

The diagnosis of encephalitis during one of the exanthemata is not difficult, with a history of onset of neurological or mental signs at varying periods following the rash.

There is much disagreement concerning the causative agent in these cases. Some investigators believe the encephalitis is due to the agent causing the exanthem, others that a virus independent of the original causative agent is responsible, and still others that the cause is an allergy of some obscure nature. The favored hypothesis is that the encephalitis is caused by the same agent as measles, chicken pox, or the other associated exanthemata. It is not possible to say, however, that some other virus or infectious agent may not be the cause.

Hemorrhagic Encephalitis.

The group of cases spoken of as hemorrhagic encephalitis constitute an important and well-known group of cases. These cases are characterized by discrete or confluent petechial hemorrhages found scattered

throughout the cerebral hemispheres, or in the brain stem. The hemorrhages may be few or numerous. They consist usually of fresh extravasations around the blood vessels and within the brain tissue, with destruction of the invaded areas. They are found in a wide variety of conditions—such as trauma, chronic alcoholism, typhus fever, malaria, rheumatic fever, influenza, hemorrhagic diatheses, arsphenamine and toxic-infectious conditions of various sorts. In alcoholism they are found especially in the roof of the midbrain, giving rise to ocular palsies and to the sydnrome known as polioencephalitis superior of Wernicke, or Wernicke's encephalitis. Recent studies tend to show that this form of hemorrhagic encephalitis is the result of a vitamin B deficiency. In trauma the hemorrhages may be few or numerous, and the same holds true for the other causes. The hemorrhagic encephalitis following arsphenamine administration usually occurs after the second or third injection. It is usually a very extensive encephalitis with much brain damage, from which recovery is incomplete. Rarely, the hemorrhage may involve the spinal cord. There is nothing characteristic of the clinical features of the hemorrhagic encephalitis occurring during toxic-infectious conditions, but the condition should be suspected whenever cerebral complications occur during fevers. Petechial hemorrhages may occur from endocarditic or pulmonary emboli.

The clinical features of the hemorrhagic encephalitides are not very well-defined and need much clarification.

Miscellaneous Types of Encephalitis.

Finally, one finds a number of cases of encephalitis which are difficult to classify. They constitute a miscellaneous group with numerous causes and many types of histological pictures.

Chief among them is a group of so-called otogenous encephalitis. These cases develop secondary to middle ear infection. The pathological picture is not clearly defined, but it has been described as a non-suppurative encephalitis, by which is probably meant a non-infectious encephalitis associated with focal inflammations. The clinical signs are those of a focal cerebral lesion, the onset being frequently with convulsions. Headache, mental confusion, and fever may be found in this syndrome. The clinical picture varies greatly, but the important feature to recall is that the process may appear in a case with middle ear infection. This type of encephalitis is of great practical importance, for the problem arises during cerebral complications in middle ear infection as to whether one is dealing with an encephalitis or with brain abscess. There is no question that cases of otogenous encephalitis occur and that they are best treated by conservative rather than by radical neurosurgical methods. They may give rise to focal cerebral signs just as does abscess, but there is no increased pressure as in the latter.

Encephalitis has been described following B. abortus infection. The brain and meninges in such cases contain miliary granulomas. It has been reported also following the injection of horse serum. Facial erysipelas has been found on a few occasions to be associated with an encephalitis characterized by large areas of demyelination in the brain. Cases of encephalitis have been recorded in gonorrhea. Pneumoconiosis has been reported with a complicating encephalitis. A non-suppurative encephalitis has been reported following labor.

Toxic enchephalitis has been reported in children, associated with acute infections such as otitis media, pneumonia, scarlet fever, and septicemia. The clinical picture in these cases showed a rapidly developing diffuse cerebral involvement, early stupor, hyperpyrexia, and death in three or four days. It is quite probable that a toxic encephalitis of this type, with vessel damage, but without evidence of inflammation may occur in adults during high fevers or severe toxemias.

Summary.

These random observations serve only to emphasize the many forms of encephalitis which may be encountered not only in neurology but in general practice. The purpose of working classifications is to clarify one's ideas so that some degree of order may develop from a confused or complicated problem. This I believe is the main purpose of such a classification as I have outlined. If it helps to insert in its proper slot some obscure case of encephalitis, and by so doing defines more specifically the diagnosis of encephalitis it has done all that can be hoped for in such a discussion.

COORDINATION OF PUBLIC HEALTH AND RELATED AGENCIES*

CARL V. REYNOLDS, M.D.,
Secretary and State Health Officer

The world today seems to be in a state of flux. There is great unrest in our religious, social and economic structure. It seems that the world has forgotten the golden rule and that this rule has been exchanged for selfish individualism, with the result that we are at one another's throats. There is good in the worst of us, and in my opinion we can capitalize on this good at a round table conference by discussing frankly our objectives and ironing out our differences. We can, through consultation, develop a wise program that will contribute to the advantage of all.

In this day of rapid communication, one can no longer live unto one's self. City, county, state and inter-state boundaries are today so closely tied that our population is one large community, and it is essential to the welfare of the whole that it be treated as such.

Since the Federal and State governments began to assume their part in supplementing county and city funds for the establishment and maintenance of public health units, and have established policies under which counties, cities and districts can participate, advancements have been most encouraging.

Since 1933, we have grown from 38 full-time county and district health organizations to 76 in 1938. Ninety per cent of our population is now being ministered to by full-time, qualified personnel through county health agencies.

I have only to remind you of the past for you to realize the great advancement we have made through governmental, state, city and county cooperation in building a health program that will accrue to the everlasting benefit of the whole people.

Our health family of 580 workers is fast becoming a recognized and essential unit of our social structure, and its influence and effectiveness is being recognized and appreciated as never before in history.

There are many problems in a community so closely allied that their interests can be best served through an interchange of ideas from experts in each field. This interchange of ideas would prevent duplication, bring about a better understanding, and enlarge the field of usefulness of all agencies.

May we consider the relationship between the public health administration and the practicing physician. The passage of the Social Security Act, the La Follette-Bulwinkle Syphilis Bill, State Aid to Counties, Funds for the Erection and Maintenance of Tuberculosis Sanatoria, the Industrial Hygiene Act, and other aiding acts—namely: "A Bill to Prevent Diphtheria in Children and to Eradicate the Disease"; "Prenatal Serological Test Law"; "An Act to Require Physical Examination Before Issuance of License to Marry"; "An Act Requiring Examination of Domestic Servants", etc.—is a recognition that the government has a definite responsibility in the prevention and cure of disease and the preservation of health.

These new responsibilities are a challenge to the ingenuity of the medical profession, and all such activities should be directed, supervised and controlled by the best qualified medical personnel available.

We are at the threshold of a new era, and we can see the dawn of a new day, if only we will seize the opportunity to guide, direct and control policies. All of us recognize that health security is of basic importance to human happiness and well-being.

After long controversial discussions as to the merits or demerits of federal participation, the House of Delegates of the American Medical Association, in special session held in Chicago, September 16, 1938, to consider the National Health Program and establish the policies of the Association with regard to it, recommended:

Expansion of public health services, as related to the control of certain infectious diseases, maternal and infant welfare, and similar projects, with the definite understanding that the need be established and that they be efficiently handled and economically controlled. The House of Delegates approved the principle of hospital insurance and the principle of cash indemnity insurance for meeting sickness costs; recognized the need for complete medical services to the indigent under local control, and for state aid in poorer communities.

In short, the House of Delegates approved certain recommendations of the interdepart-

*Read before the North Carolina Public Health Association, Greensboro, N. C., May 1, 1939.

mental committee but reiterated its firm opposition to any compulsory sickness insurance plan. The Association has not abandoned any of its policies for the maintenance of professional standards.

It is further stated in an editorial in the A.M.A. Journal, September 24, 1938, that "the meeting of the House of Delegates had a most wholesome effect in allaying doubts and fears among the medical profession as to the position of the American Medical Association in relationship to recent propaganda that has been widely circulated in this country. The unanimity of expression and action again indicated that these representatives of 110,000 American physicians are able as a democratic body to express the wishes of the vast majority of the medical profession in this country and to speak with one voice for them."

We cannot accomplish anything through continued agitation. We should be democratic enough to follow the advice of the vast majority of our profession. If we could only admit this point we should set about to submit a workable plan that will retain our individuality and give the patient the right to choose his medical or surgical adviser.

This can be accomplished if the program control is placed where it should be, within the ranks of the medical profession.

I believe that we can accomplish nothing through rebellion. We must recognize and accept the truth.

To regiment medical service is to destroy its efficiency.

To preserve the present standards of medical service and promote its continued growth, we must foster individual attainment and recognize it by a compensation commensurate with its importance, at the same time realizing that selfish individualism is hazardous and that mass protection is necessary to social security.

There must be a correlation and coordination of the activities of the practicing physician and public health administrator that will best serve the whole people. In this manner, we can "make progress serve us instead of enslave us".

Education.—The physician, the dentist, the nurse, and the nutritionist have a technical knowledge and are trained therapeutists, but most of them are not trained in pedagogy. The school teacher, on the other hand, does not have the technical knowledge, but is adequately trained in pedagogy.

With this in view, there is, at this time, a plan whereby the facilities of the State Board of Health and the State Board of Education will be integrated in the development of a unified health service in the public schools of our state—by setting up jointly, as an initial step, a coordinating agency.

In this co-ordinating agency it is understood and agreed that there is to be full cooperation between the two agencies in regard to health and physical education, but that ultimate authority in instructional matters shall remain with the State Department of Public Instruction.

It is understood and agreed also that with regard to technical matters of sanitation and health services—such as clinics, physical examinations by physicians, follow-up work for the correction of defects, and immunization programs—there is to be full cooperation between the two agencies, but ultimate authority in such matters shall remain with the State Board of Health.

The plan presented in the proposal, therefore, is designed to correct defects in the organization by bringing about more effective team work between the two agencies in the formulation and execution of a school health program which will meet more adequately the needs of the people.

The importance of such a relationship can be realized when we consider the good that can be accomplished by an army of 24,000 qualified teachers instructing 900,000 children, who will in turn instruct their parents.

Welfare.—It is generally recognized that health and education are basic in establishing social and economic security. It is equally appreciated that there are allied essentials in perfecting this ideal—environment, clothing and housing. This would immediately suggest a correlation of health, education and welfare activities.

At this time, through the State Commissioner of Public Welfare, we attempting to establish a harmonious working relationship between health and welfare agencies. Statements of the duties and responsibilities of the County Superintendent of Public Welfare, and an outline of the Public Health practices and services approved by the State Board of Health were sent out for study.

This communication suggested that the Superintendent of Public Welfare and the local Health Officer discuss together any points which were not thoroughly understood at the time.

Agriculture.—Walter B. Cannon, Professor of Physiology, Harvard University, says: "In the United States the population has changed from about 60 per cent rural to 60 per cent urban since 1900". This is a significant trend for which there must be a reason. People do not leave the country because they cease to love it. They go in search of the labor-saving devices and modern conveniences which contribute to an easier and a "more abundant life".

Low birth rate in the urban population is to some extent compensated to the cities by the higher birth rate of the rural population. This condition can only be changed and improved through an interchange of ideas with state and county agricultural officials. Our object would be to have a unified agricultural program connected with other allied agencies.

We have learned that an impoverished soil means impoverished foods. If the soil lacks essential food elements, the foodstuffs grown on it may show a similar deficiency. We know that foods given in proper amounts and coming from proper sources will contain the proteins, carbohydrates, fats, minerals and vitamins necessary for the body's physical needs and for developing protective forces that will resist diseases.

Medical science is far in advance of the public's willingness to take advantage of it. There must be a reason. Ignorance and indifference both play a part; poverty plays a part. But, to my mind, ignorance of the basic essentials of our body requirements is the outstanding obstacle.

Health education is needed to combat misconceptions, misinformation, and carelessness that lead to improper selection and preparation, or to contamination of these essential foodstuffs.

These brief statements will make us realize and appreciate the great advantage that could accrue from conferences among such allied agencies.

May I suggest a plan for your careful consideration and mature judgment?

Plan.—We have our people needing medical care in one group.

We have the medical profession to administer that medical care in another group.

We must have the best available mind to direct this most important and vital element in moral, mental, physical, social and economic welfare.

To whom shall we turn for this service?

The unanimous decision would be that the medical mind is the better qualified.

This being admitted, may I present to you a Board of Directors, namely: Secretary and Chairman of the Executive Committee of the State Medical and Dental Societies; representatives from County Medical and Dental Societies; governmental representatives; State Health Officer; County Health Officers; City Health Officers; representatives from the departments of Public Welfare, Agriculture, Home Economics, and Public Instruction, from Parent-Teacher Associations, from Hospital Boards, from the Institution for the Blind, from mental hygiene groups, and from civic clubs.

By this board ways and means are to be devised to render service to its citizenry in preventive medicine, medical and surgical care, maternal and child hygiene, crippled children and care for the insane and blind.

North Carolina has 100 counties. Would it not be an advanced step to organize 100 conference committees composed of representatives from all interested agencies to study out problems and formulate plans to solve them?

Yes, we have done much, but the half has not been done! The determined public has set about to do it and they should have leadership. Organization conferences will prevent misunderstadings among those who have an honest purpose in view.

An honest discussion will bring forth a sane decision, and to my mind, it will prevent the regimentation of medical men. It will retain the individual initiative and resourcefulness, and merit will be awarded commensurate with its attainments. Qualifications will be the standard in selection and not political favor.

A democracy of allied agencies with a continuity of purpose, dedicated to service, is the answer to the world's health, educational, social, and economic problems.

RECENT STUDIES IN THE CARE OF THE LATE GESTATIONAL TOXEMIAS

BOYD HARDEN, M.D.

BURLINGTON

The care of the late gestational toxemias resolves itself into a consideration of (1) those changes which occur in the maternal constitution in so-called normal pregnancy; (2) the appearance of those factors which transform an uncomplicated gestation into a pathologic state threatening the well-being, if not the life, of both mother and infant; and (3) the adjustment of the maternal constitution to meet compatibly the demands of reproduction.

The mechanisms of the profound changes which occur in the maternal constitution in so-called normal gestation are imperfectly understood. The age at which the pregnancy supervenes has an influence on the course of reproduction. The nutritional demands of the fetus, and the disposal of its waste products place increased demands on the maternal host. Normal pregnancy is associated with an increase in basal metabolism which is proportional to the combined surface area of mother and fetus. A demand for increased minute volumes, at the site of impregnation, may be satisfied in several ways: (a) Additional erythrocytes may be formed. Yet, normal pregnancy has been shown to exhibit three distinct types of anemia: the physiologic type, so-called, characterized by a progressive increase in anemia up to the third trimester when an abrupt rise in hemoglobin and erythrocytes occurs; the hypochromic, or chlorotic type, characterized by a lowering of hemoglobin and associated with hypoacidity; the macrocytic type, characterized by progressive anemia and complete post-histamine gastric anacidity. (b) The cardiac output may be augmented by an increase in the venous return to the heart, and this in turn may be influenced by an increase in the cardiac rate. Cardiac hypertrophy may participate in the mechanism of volume increase. The greater systolic delivery of blood results in greater pulse amplitude and increased pulse pressure, which must be counterbalanced by vasomotor control to prevent elevation of blood pressure. Yet, the majority of pregnant women have been shown to exhibit capillary spasm.

The chief changes in the glands of internal secretion in normal pregnancy concern those organs whose functions govern metabolic rate and the factors of growth and development. The anterior lobe of the pituitary, the thyroid, the parathyroids, the cortex of the adrenals, and the ovary present the greatest gross and microscopic evidence of increased activity.

The constitutional reserves of protein, fat, carbohydrate, inorganic salts, water, and vitamins, and the metabolic efficiency of the woman as she enters the responsibility of reproducing her kind are problems for patient and meticulous research. The response of the maternal constitution to the demands of gestation is influenced by such factors as physical habitus, malnutrition, disturbed function of the glands of internal secretion, disease of vital organs, previous acute illnesses with incomplete recovery, intercurrent infections, foci of infection, fever, and drugs.

Nitrogen reserves at the beginning of pregnancy are not the same in all women. The retention of nitrogen is out of proportion to the fetal need, the enlargement of the organs of generation, the increase in the daily needs of the maternal host, and the retention of nitrogen begin early in gestation. This positive nitrogen balance prevails in spite of lowered total plasma protein, with no evidence of retention of nitrogenous waste products in the blood and with decreased total nitrogen excretion and changes in the nitrogen partition in the urine. It is reported that one patient. in the last 21 weeks of gestation, stored 446 grams of nitrogen. After parturition and 53 days of lactation, 250 grams of nitrogen were still held in reserve.

Reports vary as to the storage of iron, sulphur, calcium and phosphorus in normal pregnancy. There is about a 5 per cent lowering of the total serum base, unexplained on the basis of fetal needs or of organic acid excess.

There is doubt about the interpretation of the blood sugar content of women in uncomplicated gestation.

Normal pregnancy is associated with a marked rise of about 30 per cent in the total lipoid content of the blood.

The moot questions in normal pregnancy have been deliberately brought into this discussion to emphasize our inability to reach a solution of a more difficult problem until we have laid the ground work for its analysis.

The premonitory symptoms and signs of convulsive seizures are outlined in any good text book of obstetrics and have been specifically summarized from a series of patients in the Elizabeth Steele Magee Hospital in Pittsburgh in a previous monograph[1]. There is no point in enumerating material which is already familiar.

The purpose of this summary was to try to establish one finding, which in our experience at least, is peculiar to every patient whose pregnancy culminated in pre-eclampsia or eclampsia. We were unable to find such common denominator in a review of more than 39,000 papers, directly or indirectly related to this problem. At this stage of our study there was admitted to our wards a patient in the eighth month of gestation, with a blood pressure of 244/146, with headache, scotomata and transient blindness; tinnitus; formication and numbness of the extremities; sore throat without apparent cause; heartburn; dyspnea; precordial distress; lancinating pain in the epigastrium; nausea and vomiting; deep, dull, boring, pain in the right upper quadrant; backache; obstipation; frequency, urgency, burning and pain on micturition; excoriating leucorrhoea; a massive generalized edema; and an inordinate fear of impending death. Her red cell count was 1,800,000, and her hemoglobin was less than 20 per cent by the Haden-Hauser hemoglobinometer. Her urine boiled solid. A twenty-four hour specimen of 1285 cc. showed a quantitative protein content of 155 grams. It occurred to us that no human constitution under any condition of life could long withstand the dissipation of so vital an element as protein to so profound a degree without serious or fatal consequences.

In coming to this conclusion, we discovered one factor which, in our experience, has occurred consistently in the toxemias of pregnancy both early and late. This factor is *marked nitrogen deficit.* A regime was instituted to control this deficit. Patients were required to have at least eight hours of rest each day, foci of infection were eliminated wherever possible, elimination by bowel was secured by the use of milk of magnesia or soap suds enemata, and each patient was given a sufficient caloric intake to satisfy her basal needs plus the requirements of the infant. When a patient was unconscious, or unable to take food by mouth, intravenous glucose was given in 10 to 25 per cent concentration in sufficient quantities to approximate the individual's caloric requirements. The diets contained the basic protein requirement of the maternal host, plus the requirement of the infant, and the protein lost in the urine.

As proof that our diets supplied the basic nutritional demands for protein of the female body in pregnancy, the following evidence is presented:

Thirty-six patients with typical pre-eclampsia and 42 patients with typical eclampsia referred to the hospital for treatment were placed on these diets, which were calculated from the DuBois metabolism chart. The average caloric requirement and the average diet given to each group is presented in Chart I.

CHART I.

Pre-Eclampsia

			Average Intake in Grams		
Avg. Ht.	*Avg. Wt.*	*Avg. Age*	*Protein*	*Fat*	*Car.*
155.30 cm.	80.3 kilos	29.9 yrs.	82	61.1	218

ON THE DuBOIS CHART:
155.30 cm. meets 80.3 kilos at 1.8 square meters.
At 29.9 years of age the female requires 37 calories per square meters of surface area per hour.
1.8 square meters × 37 calories × 24 hours = 1598.4 calories as the basic caloric requirement of the mother.

DIETARY VALUES:

Protein	82 gms. × 4 cal. per gram =	328.00 cal.
Fat	61.1 gms. × 9 cal. per gram =	549.90 cal.
Carbohydrate	218.0 gms. × 4 cal. per gram =	872.00 cal.
	Administered in diet	1749.90 cal.

Eclampsia

			Average Intake in Grams		
Avg. Ht.	*Avg. Wt.*	*Avg. Age*	*Protein*	*Fat*	*Car.*
154.1 cm.	80 kilos	26.6 yrs.	69.4	61	209

ON THE DuBOIS CHART:
154.1 cm. meets 80 kilos at 1.8 square meters
At 26.6 years of age the female requires 37.2 calories per square meter of surface area per hour.
1.8 square meters × 37.2 calories × 24 hours = 1607.04 calories as the basic caloric requirement of the mother.

DIETARY VALUES:

Protein	69.4 gms. × 4 cal. per gram =	277.60 cal.
Fat	61.0 gms. × 9 cal. per gram =	549.00 cal.
Carbohydrate	209.0 gms. × 4 cal. per gram =	836.00 cal.
	Administered and consumed in diet	1662.60 cal.

After stabilization on the diets the fate of the protein in the diet was determined as follows:

The urinary non-protein-nitrogen was de-

(1) Harden, Boyd: A Study in Pre-Eclampsia and Eclampsia, University of Pittsburgh Press, 1936.

termined, this figure representing the nitrogen that was actually metabolized by the body. This multiplied by 6.25 was converted into protein. To this was added the amount of protein appearing in the urine and feces and the total of these three subtracted from the protein intake. The difference, when positive, represents stored protein, and when negative, represents a protein deficit.

Chart II gives the average results of these determinations on the two series of patients, showing in both groups a definite and considerable storage of protein.

CHART II.

Protein Metabolism

(Average of 42 eclamptic patients)

	Gms. Protein
Lost in urine	7.62
Lost in feces	17.81
Metabolized (6.25 × Urinary N.P.N.)	38.75
Total (lost and metabolized)	64.19
Given in diet	69.40
Total (lost and metabolized)	64.19
Amount stored	5.22

Protein Metabolism

(Average of 36 pre-eclamptic patients)

	Gms. Protein
Lost in urine	5.75
Lost in feces	12.75
Metabolized (6.25 × Urinary N.P.N.)	42.38
Total (lost and metabolized)	60.88
Given in diet	82.00
Total (lost and metabolized)	60.88
Amount stored	21.12

In a period of seven years, 704 patients with late gestational toxemias were admitted to our wards, no one of whom developed convulsive seizures under this regime; yet the number of eclamptic patients referred to the hospital in convulsions maintained the same incidence in the community as that previous to the adoption of this regime.

Conclusion: It would appear that protein stabilization has dealt with fundamental factors in the prevention of eclampsia.

Discussion

DR. W. L. THOMAS (Durham): Mr. Chairman and Members of the Society: It would seem that Dr. Harden is trying to show us here, not the cause of pre-eclampsia and eclampsia, but a method of preventing and treating it—that is, the protein stabilization of a patient.

We found that the dietary deficiencies and toxemias in North Carolina seem to go hand in hand. We see more patients who have pellagra from certain districts than from others. We also seem to see more toxemias from the same districts.

We have a feeling that a long-standing dietary deficiency, perhaps not of one generation but of several generations, probably accounts for the great amount of toxemia that we have.

I think Dr. Watson will be interested to know that we admit at Duke Hospital at least 40 per cent of toxemias in our total obstetric patients. We are working on it and we hope some day to be the ones to carve our name in the niche which I understand the University of Chicago has reserved for the name of the man who discovers the cause of eclampsia. It seems that here in North Carolina where we have so much toxemia one of you gentlemen will discover the cause of it.

I enjoyed Dr. Harden's paper very much. I think he has done a great deal of work, and his monograph from the Pittsburgh Hospital is outstanding. I think it was published in 1933. I wish all of you could read it.

NEW UROLOGICAL PROCEDURES OF GENERAL SURGICAL INTEREST

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CHARLOTTE

A few new procedures with which the urologist is familiar and which he uses daily will be discussed briefly. Certain phases of major operations and some minor procedures will be considered. New approaches to combat old complications—such as infection and hemorrhage—will be explained. No problem will be dealt with that should not be of vital interest to a mixed medical audience.

Prostatic Resection

One of the most important major urological operations discussed in recent years has been a reviving of the old punch operation. The modern and well known operation popularized as prostatic resection has been made possible by the inventive genius of many urologists, by the great improvements in the manufacturing of instruments, and by the added knowledge of the electric current used both for cutting and coagulation. No operation during my professional experience has been so enthusiastically received either by the medical profession or by the laity as has prostatic resection. It is quite natural that misinformation has been disseminated among the doctors throughout the country by the commercial instrument houses recommending and trying to sell the various prostatic resection machines, and that early advocates of this type of operation for the removal of a portion of the prostate were overenthusiastic. Often a referring doctor will send in a patient with large residual urine, severe infection, or what not, asking that we resect his prostate as casually as he would

*Read before the Second General Session of the Medical Society of the State of North Carolina, Bermuda Cruise, May 13, 1939.

ask for a cystoscopic examination. If this is true of the medical profession—as it surely is—what must the laymen think about it? They have even been told that they do not have to be cut — the "selling surgeon" or "commercial surgeon" meaning to convey the idea to the patient that he cannot see the cut; so the patient comes to the doctor asking for a certain type of operation which he believes is nothing more than looking into the bladder and by some mystic process melting the prostate away painlessly, without discomfort afterwards and with no time spent in the hospital.

What is the truth about this remarkable operation? Every urologist now realizes that prostatic resection is a highly specialized technical operation done with great danger in inexperienced hands and accompanied by many complications even in the hands of the experienced operator. No one who has done very many resections can doubt this statement. We have the same pitfalls in prostatic resection that we have in any other method of prostatic surgery—namely, infection and hemorrhage.

Have we improved in our method of dealing with infection of the prostate? Surely we have. Patients with no residual urine or with little residual urine are operated on as soon as the general physical and other necessary examinations have been done. No retention catheter is placed in the bladder, and no long period of preparation is thought necessary. In this special group neo-prontosil is a valuable drug to give both before resection and after resection in order to prevent infection or to limit infection already present.

Our methods of dealing with hemorrhage have also improved. Four procedures are worthy of note: (1) The injection of pituitrin[6] by a long needle through the resectoscope directly into the prostate gland in the large succulent prostate reduces hemorrhage during the operation, and there is no evidence that there is bleeding following operation. (2) The use of injections of theelin[6] in the preparation of patients for prostatic resection has been useful in our hands, and there appears to be less bleeding at the actual time of resection. (3) The use of the combined retention catheter and Foley bag[1], or what is now known as the Foley hemostatic bag, has been a godsend to us in our prastatic work. (4) The irrigation[6] with 20 per cent Karo syrup through the Foley hemostatic bag is of unquestionable value in the cases that are inclined to bleed slowly or to ooze. This form of irrigation prevents or limits the formation of clots in the bladder.

Urinary Infections

In the not far distant past we were accustomed to treating pyuria without concerning ourselves with the organism which was the etiological factor. In the last two or three years our whole conception of treating urinary infections has completely changed. The very first thing we want to know is the offending organism; then we prescribe the drug or diet—or both—which will either inhibit the growth of this particular organism or render the urine sterile. Of the new methods of treating urinary infections, the ketogenic diet, mandelic acid, sulfanilamide, sulfapyridine, and neo-arsphenamine have done more to put the treatment of urinary infection on a scientific basis than all the former theories and treatments combined.

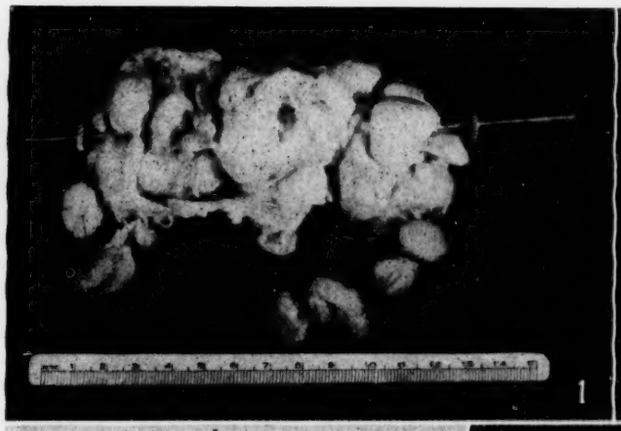
A great many of the severe infections of the kidney are due to the staphylococcus, and this organism is of great importance in stone formation and the growth of stones. Especially is this true in recurrence of calculi post-operatively. Some of the new drugs act favorably on some strains of cocci, but the coccal infections still present the outstanding problem and the one which we hope will continue to be worthy of the best research.

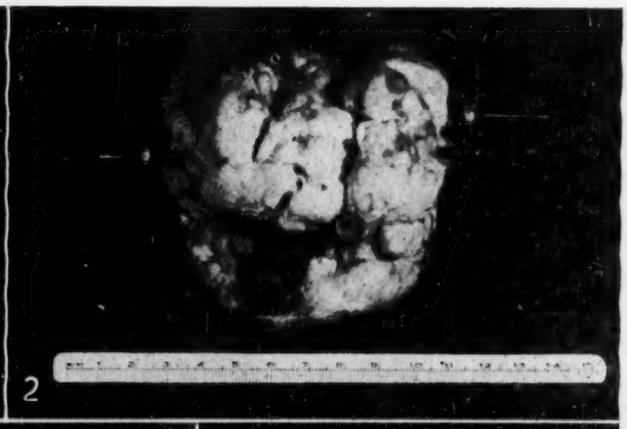
Intravenous Urography

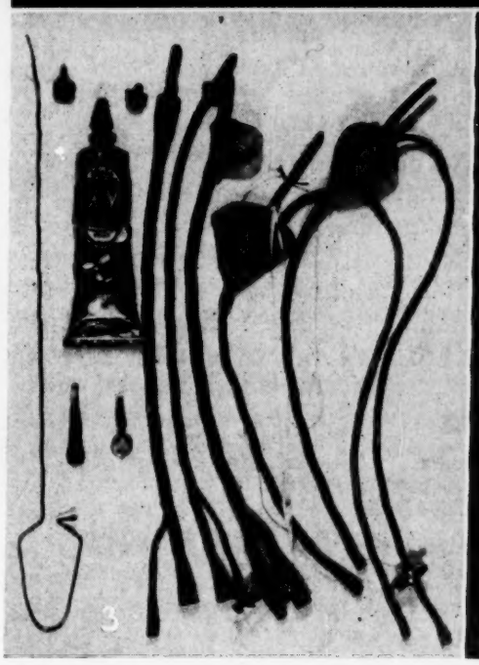
This procedure is one of the most valuable single aids which have been discovered in recent years. It is a lamentable fact that few urologists, and still fewer roentgenologists and other physicians who have x-rays take advantage of this valuable diagnostic procedure. They do not seem to appreciate the great importance of the preparation of the patient. Lack of preparation of the patient means the useless injection of an expensive drug and the added cost and waste

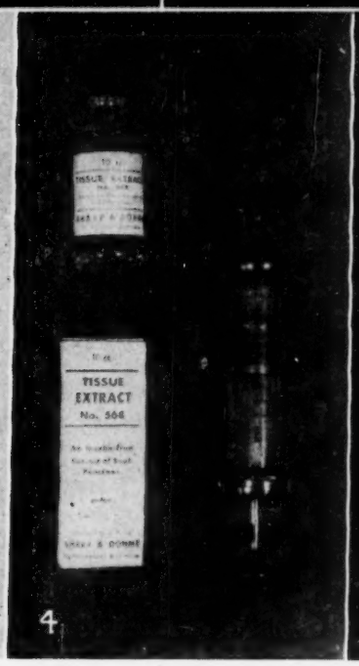
6. ———: Letters of the Urologists Letter Club of the United States, Vol. I and II, 1938 and 1939, Burgess Publishing Company.

1. Foley, Frederick: Hemostatic Bag Catheter, J. of Urol. 38:134, 1937.









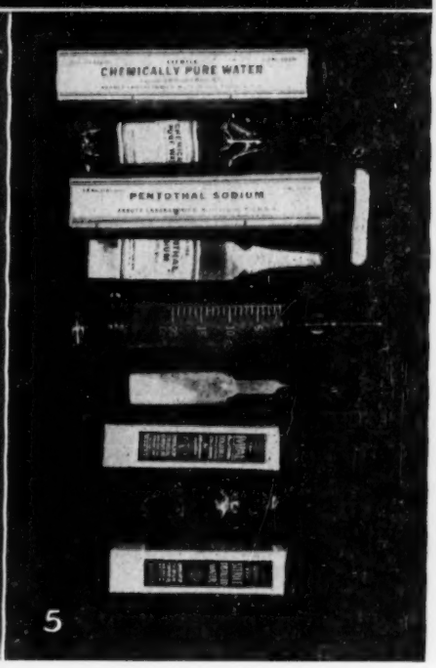


Figure I: Adenomatous hypertrophy (grade IV) Numerous spheroidal bodies resembling bunch of grapes. Best removed by open operation.

Figure II: Adenomatous hypertrophy (grade IV) 150 grams. Best results obtained by prostatectomy not resection.

Figure III: Recent devices for control of post-operative hemorrhage in prostatic surgery. Brake bag. Various sizes of Foley's hemostatic bag.

Figure IV: Tissue extract with syringe to forcibly illustrate its practical use in many forms of kidney colic and ureteral spasm.

Figure V: Intravenous anesthestics well adapted to minor urological surgery in office or hospital practice.

of one or more x-ray films. As a functional kidney test, intravenous urography probably tells us more in a graphic way than any common "work test".

New Methods of Treating Hydrocele

The recent injection methods to obliterate the hydrocele sac advocated by Dr. George Livermore[2], and the injection of quinine hydrochloride and urethane advocated by Louis Baretz[3] are of great importance to all urologists and surgeons.

2. Livermore, George: Livermore Method for Relief of Hydrocele, J. of Urol. 39:418, (April) 1938.
3. Baretz, Louis: Cure of Hydrocele by Injection, N. Y. J. Med., 38:489-493, (April) 1938.

Interstitial Cystitis (Hunner's Ulcer)

Interstitial cystitis probably produces the most distressing symptoms and acute and chronic suffering of any disease of the bladder. Certainly our knowledge of both palliative and curative methods at the present time is very much limited, and any drug or procedure which will give the patient comfort is worthy of a trial. Used purely on an empirical basis, neo-arsphenamine, given in Gm. .3 or Gm. .4, six to ten doses, has oc-

casionally produced noteworthy results. The use of alcresta ipecac (Lilly), giving six to ten tablets at bedtime, has produced an occasional brilliant result. We are at the present time treating two patients with these drugs and have noted great improvements.

Intravenous Anesthesia

Surely the urologist, of all specialists, should be most interested in anesthesia. In the intravenous injection of pentothal sodium he has an anesthetic which is easy to administer, is practically without danger if carefully administered, and which should prove a boon to the urologist and a blessing to his nervous and apprehensive patients. One cc. of this drug puts the patient to sleep in ten seconds, and he awakens promptly without ill effect.

Tissue Extract No. 568 (S&D) [4]

From the beginning urologists have been trying to find a drug which will relax the ureter and produce no untoward effects. The injection of 2 cc. to 4 cc. of the residual solution after insulin has been precipitated has proven very valuable in our hands. In cases where we deside to remove a ureteral stone in the lower third of the ureter by operative cystoscopy, in facilitating the passage of instruments when spasm exists, and in the dilatation of strictures, we have found this drug very valuable.

Post-Operative Routine (Calculous Disease)

Every urologist looks forward to the day when he can with certainty remove a calculus or calculi from any portion of the urinary tract and assure the patient that he will not have recurrence. It is both embarrassing and distressing to the urological surgeon to remove a stone from the kidney, ureter, or bladder, and have the patient return, sometimes in an unbelievably short time, with another stone. The past few years have added much to our knowledge of preventing stone formation by the eradication of focal infection, the elimination of stasis, the correction of metabolic errors, and the correction of vitamin deficiency. The taking of plain radiograms and intravenous urograms before the patient is dismissed from the hospital is now considered necessary. That dietary adjustment is absolutely essential in the plan of preventing re-formation of stones is now accepted. The following facts should be noted: (1) Change of P^H by diet depends on (a) analysis of the stone; (b) P^H of urine from the diseased kidney. (2) No single diet can be applied to all patients; individual adjustment is of great value. (3) If the calculus is composed of uric acid or cystin, the food should be purine free. (4) If the calculus is composed of oxalates, foods rich in oxalates should be restricted. (5) Operative removal of stone is but one phase in the management of this disease.

Renal Mobility

Dr. Elmer Hess[5] of Erie, Pa., has emphasized mobility of the kidney and has stressed the importance of establishing a normal position and normal movements of the kidney to compare with abnormal positions and movements as an aid to diagnosis in difficult conditions—as, for example, perirenal abscess and sub-diaphragmatic abscess. When an understanding of the normal and abnormal mobility of the kidney in health and disease has been reached, many difficult problems of a clinical nature will be more easily solved.

4. Carroll & Zingale: Effect of Pancreatic Tissue Extract on the Ureters, S.M.J. 3:233-236, (March) 1938.

5. Hess, Elmer: Renal Mobility, J.A.M.A. 110: 1818-1823, (May 28) 1938.

CLINICAL EXPERIENCE WITH SULFAPYRIDINE*

W. A. MacCOLL
DURHAM

One year ago this month sulfapyridine made its appearance. Since this time it has established itself as a near-specific in the treatment of pneumonia, and as a valuable drug in certain other types of infections. For the past six months the drug has been under observation at Duke Hospital, and the present report is a presentation of our experience, together with the results which others have obtained elsewhere.†

Sulfapyridine is dispensed in 0.5 gram tablets or in powder form, and is administered orally. The drug itself is soluble only one part in one thousand, which renders it impractical for intravenous or subcutaneous use; the soluble sodium salt which recently made its appearance has not yet received

*From the Department of Pediatrics, Duke University School of Medicine and Duke Hospital. Read before the Bermuda meeting of the Medical Society of the State of North Carolina May 10, 1939.

†The sulfapyridine has been generously supplied by Merck and Company of Rahway, New Jersey and the Calco Company of Bound Brook, New Jersey.

sufficient trial for evaluation. (Recent reports from Johns Hopkins Hospital are quite favorable. Ed.) Sulfapyridine is absorbed rather readily from the intestinal tract, reaching an effective level in the blood stream within five to six hours. It is conjugated in the body in about the same proportion as sulfanilamide, and excreted through the urine.

Dosage of the drug has not been standardized, owing, perhaps, to variation in absorption and excretion. Many schema have been drawn up, but the necessary modifications in these to meet individual demands have rendered them of little value except as basic schedules to be varied according to such factors as degree of illness, tolerance to the drug, therapeutic response, or the appearance of complications. Our basic schedule has been as follows:

Under 1 year of age	1 gram daily
1-2 years of age	2-3 grams daily
Over 3 years age	3-5 grams daily

given in divided doses at four or six hour intervals. Both a large and a small initial dose have been tried. We have noticed little difference in the effect, although others feel that the large initial does (one half the calculated daily amount) is warranted in order to assure a high initial blood level, and to prevent the development of tolerance to the drug on the part of the bacteria.

The drug has established itself most firmly as an agent for the treatment of pneumonia due to the pneumococcus. Evans and Gaisford[1] report a reduction of mortality in adults from 27 per cent to 8 per cent when the drug was used; Agranat and others[2] from 10 per cent to 3.7 per cent. Graham[3] and his associates had 23 per cent mortality in a control series, 12 per cent in a serum treated group, and 6 per cent in cases treated with sulfapyridine. Anderson and Dowdeswell[4] report a 75 per cent reduction of mortality with a marked reduction in the length of the illness when the drug was administered. Flippin et alii[5] showed a mortality of 4 per cent. Favorable reports of its use in children have come from St. Louis,[6] Cincinnati,[7] Baltimore,[8] and Durham, [9] leaving little doubt as to the efficacy of the drug in pneumococcic pneumonias.

Since October, 1938, all patients admitted to the Pediatric Service at Duke Hospital with a diagnosis of pneumonia have been treated with sulfapyridine. X-rays were taken on admission, and cultures obtained from the nasopharynx. The drug was then given in the dosage as discussed above. Fluids were administered freely, and the diet was given as tolerated. In the matter of duration of treatment our procedure has differed somewhat from that used by certain others. Some have given massive doses for forty-eight hours, then stopped altogether; others have graduated dosage down from the first to the fourth day; again the drug has been continued for forty-eight hours after the temperature has reached normal. But there is at present no more satisfactory criterion for the withdrawal of the drug than the total white blood cell and the differential counts, which we have found of invaluable prognostic aid. Experience has shown us that if treatment is discontinued while there is still hematologic evidence of infection—i. e., elevated white cell count or toxic shift in the hemogram — recurrences or relapse may occur. This relapse usually responds promptly to the reinstitution of therapy. Clinical improvement precedes hematologic improvement, and the state of the process in the lung is more precisely reflected on the

1. Evans, G. M. and Gaisford, W. F.: Treatment of Pneumonia with 2-(p-aminobenzenesulphonamido) pyridine. Lacet 2: 14, July 2, 1938.
2. Agranat, A. L., Dreosti, A. O. and Ordman, D.: Treatment of Pneumonia with 2-(p-amino benzene sulphonamido) pyridine (M & B 693). Lancet 1: 309, February 11, 1939 and Lacet 1: 380, February 18, 1939.
3. Graham, D., Warner, W. P., Dauphinee, J. A. and Dickson, R. C.: The Treatment of Pneumococcus Pneumonia with Dagenan, M & B 693, Can. M.A.J. 40: 325, 1939.
4. Anderson, T. F. and Dowdeswell, R. M. Treatment of Pneumonia with M & B 693. Lancet 1, 252, February 4, 1939.
5. Flippin, H. F., Lockwood, J. S., Pepper, D. S. and Schwartze: The Treatment of Pneumococcic Pneumonia with Sulfapyridine. J. A. M. A. 112: 529, February 11, 1939.
6. Barnett, H. L., Hartman, A. F., Perley, A. M. and Ruhoff, M. B.: The Treatment of Pneumococcic Infections in Infants and Children with Sulfapyridine. J.A.M.A. 112: 518, February 11, 1939.
7. Wilson, A. T., Spreen, A. H., Cooper, M. L., Stevenson, F. C., Cullen, G. E., Mitchell, A. G.: Sulfapyridine in the Treatment of Pneumonias. J.A.M.A. 112: 1435, April 15 1939.
8. Hodes, H. L., Stifler, W. C., Walker, E., McCarty, M. and Shirley, R. G.: The Use of Sulfapyridine in Primary Pneumococcic Pneumonia and in Pneumonococcic Pneumonia associated with Measles. J. Ped. 14: 417, 1939.
9. MacColl, W. A.: Clinical Experience with Sulfapyridine. J. Ped. 14: 277, 1939.

laboratory sheet than on the temperature chart.

In the group studied, temperatures on admission varied from 102° to 106°F., but began to fall within twelve hours after treatment was begun, and in over half the cases reached normal values in twenty-four hours. The fall in temperature was accompanied by relief from anorexia and toxicity. This apparently represents a rapid lysis rather than the usual crisis of lobar pneumonia. Improvement was continuous, except for an occasional relapse of temporary nature as discussed above. The blood picture and x-ray film corroborated the clinical impression of improvement.

The results of treatment as outlined above have been very satisfying. Fifty-eight children with pneumonia proven by x-ray have received the drug. The differentiation between lobar- and bronchopneumonia was made by x-ray and by the clinical aspects of the disease. It would be impossible to separate the two groups on the basis of reaction to treatment, for it was much the same in both. Table I gives the distribution of the patients by age.

TABLE I

	Bronchopneumonia			Lobar Pneumonia					
Age Years	Number Patients	Per Cent	Number Deaths	Number Patients	Per Cent	Number Deaths	Total Patients	Per Cent	Total Deaths
0-1	14	43	4	7	28	1	21	36.0	5
1-2	8	23	0	5	20	0	13	22.5	0
2-5	5	15	0	6	24	0	11	19.0	0
5-11	6	19	0	7	28	0	13	22.5	0

Of the cases listed as bronchopneumonia, the predominant organism from the nasopharynx was in 8 instances the Beta hemolytic streptococcus, in 8 the hemolytic streptococcus, and in 17 the two were found together. Pneumococci were isolated from 17 of the 25 cases of lobar pneumonia, but not all of these could be typed, since some were cultured after sulfapyridine therapy had been started, and it is well known that after the drug has been given the capsule of the organism loses its ability to react to specific sera. Types II, IV, VIII and XI were identified.

The average length of illness before entering the hospital was 3.1 days in lobar pneumonia and 4.4 days in bronchopneumonia. The duration of treatment was 4.8 days in both groups. In the average of all cases the temperature was normal in thirty-eight hours, and no complications (empyema, etc.) developed. As shown on Table I, only one patient with lobar pneumonia and four with bronchopneumonia died. All of these were under nine months of age; two had been premature infants; one expired probably as the result of a transfusion reaction. None of these five patients showed any beneficial reaction toward any form of treatment given.

The concentration of the drug in the blood varied from 1.1 to 15.2 mg. per cent in the total group of subjects, with a majority between 3 and 5 mg. per cent. This is apparently an effective level. Marshall's method for sulfanilamide determination was used, with sulfapyridine substituted in the standard solution.

Five cases of pneumococcal empyema have also been treated with sulfapyridine. In all cases the fluid was sterilized by the third day, but in no case did the condition clear without drainage. One patient, a six months old boy, who had been ill with empyema for eight weeks, died after 60 hours of treatment; and in one other case of empyema the fluid was sterilized, but the patient continued to run an elevation until drainage had removed the purulent material. In empyema it is our impression that the drug is of value in early stages to prevent massive spread of the process, and in later stages as an adjunct to drainage either by thoracotomy, aspiration or rib resection. The drug is found in empyema fluid in approximately the same concentration as in the blood at the same time.

One case of mediastinitis, three acute upper respiratory conditions, one case of peritonitis, and one persistent bacteremia (all of pneumococcal etiology) have responded well to sulfapyridine. Types I, II, IX, X, XXI, and XXIII have been encountered in these last two groups.

In other types of illness the value of sul-

fapyridine has not been so well established. With this in mind an attempt has been made to define the limits of usefulness of the drug. The following paragraphs represent the information obtained from a group of 50 patients suffering from a variety of complaints.

Fifteen children had upper respiratory infections with severe enough reactions to warrant hospitalization, five of them being complicated by suppurative otitis media. These were all treated on the same principles as those outlined above, with good results. One patient died, a nine months old child had had diarrhea for one week and was moribund on admission. The others showed remarkably rapid improvement, all symptoms subsiding within two days. About half of these cases were caused by the Beta hemolytic streptococcus, and the remainder yielded hemolytic staphylococci or mixed organisms on culture. Those with streptococcal infections responded a little more rapidly than those with other organisms. We have had few acute streptococcal infections, and very little has appeared in print in regard to the treatment of the streptococcal diseases.. Experimentally the drug is said to be as effective as sulfanilamide. Conclusions in this regard must await further trial.

No information on a large group of cases infected with the hemolytic staphylococcus aureus has come to our attention, although several isolated reports have appeared. Bliss and Long[10] report that sulfapyridine is more effective than sulfanilamide in experimental staphyloccoccal infections in mice. Our series is small, but certain impressions have been gathered which seem to be worth reporting. In conditions in which the staphylococci are on the skin, tonsils, or "outside" the body, sufficient help can be had from the drug alone to overcome the infection. When the organism invades the deeper tissues, the blood stream, or the central nervous system, the drug appears to do little more than hold the infection in check and, unless the antibody response by the patient is immediate, the drug proves inadequate. One patient with staphylococcus bacteremia showed only slight improvement during six days of sulfapyridine therapy, but was well two days after 20,000 units of staphylococcal antitoxin had been administered. Similarly a patient with chronic low grade pneumonitis, who persistently yielded staphylococci on throat culture after six weeks of sulfapyridine, cleared completely when staphylococcus toxoid was given also. On the other hand some of our cases of staphylococcal septicemia have died in spite of a combination of all therapeutic measures at our disposal. Nevertheless, in these severe infections, sulfapyridine in conjunction with serotherapy appears to offer more hope of cure than any other measure we have possessed heretofore.

Many papers have appeared in the English journals concerning results obtained in the treatment of acute gonococcal infections. The latest of these,[11] gives a summary of the work which has gone before, and reports a 93 per cent cure in 97 patients with gonorrhea. Our experience has been neither so vast nor so encouraging. Three cases of vaginitis have responded remarkably well, but in a case of opthalmia a staphyloma developed and the eye was lost.

We have treated four cases of meningitis, with one death. This patient had symptoms of a brain abscess. The other three were caused by M. catarralis, meningococcus, and staphylococcus. All responded well, and within three days all symptoms of disease had disappeared. Seven cases of pneumococcus meningitis have been reported as having recovered.[12],[6]. It is interesting that only about 40-60 per cent of the drug permeates the spinal canal, suggesting that a heavier dosage may be indicated in meningitis.

With regard to the toxicity of sulfapyridine, early reports were apparently overoptimistic. It was originally stated that only one-fourth the toxicity of sulfanilamide was to be expected, but recently numerous reports have shown it to have all the toxic effects of sulfanilamide. This is not too startling, inasmuch as sulfapyridine contains the entire sulfanilamide radical. Acute hemolytic anemia, agranulocytosis, mental effects, vomiting, cyanosis, hematuria, photo-

10. Bliss, E. A. and Long, P. H.: Comparative Therapeutic Effect of Sulfapyridine in Experimental Staphylococcus Aureus Infections in Mice. Proc. Soc. Exp. Biol. and Med. 40: 32, 1939.

11. Bowie, F. J., Anderson, T. E., Dawson, A., and MacKay, J. F. Treatment of Gonorrhea by B & B 693. Lancet 1: 711, April 8, 1939.

12. McAlpine, D. and Thomas, G. C.: Pneumococcic Meningitis Treated with M & B 693, Lancet 1: 1754, April 1, 1939.

sensitization of the skin, and fever have all been recorded. The most troublesome of these has been vomiting, and enteric coated tablets and other measures are being tried to obviate this difficulty. Vomiting has occurred with a frequency of about 25 per cent, but has seldom been severe enough to interfere with therapy. Acute anemia and agranulocytosis do not progress after the drug is discontinued, and no fatal case has been recorded as yet. Several workers[13] have found crystals of the drug in the kidneys and ureters of animals who developed hematuria during treatment. Crystals have also been noted in the urine of patients developing hematuria. Thus, for general use, the same precautions as those used with sulfanilamide must be employed.

Perhaps it should be emphasized here that all low white cell counts do not mean agranulocytosis. We have observed several cases in which the count fell to values of 2500 to 3000. In all of these there were still 50 per cent or more granulocytes. The interpretation apparently is that the marrow has been working overtime to meet the demands of the body while the infection has been progressing, as evidenced by the appearance in the blood of large numbers of immature cell forms. When the infection has been overcome by the action of the drug plus the immunizing response of the body, the demand for white cells falls, the marrow stops putting out immature forms and, as it were, catches up on production; for, when the count rises again, the mature forms are back to their normal proportion. Thus the explanation for the low count would be the destruction of the immature forms in the circulating blood, and the temporary lack of production on the part of the marrow.

Numerous clinicians have suggested that the drug has an antipyretic action similar to the salicylates. That this is not the case is suggested by the following observations: (1) Sterile fever induced in rabbits failed to respond to administration of the drug; (2) a case of acute rheumatic fever failed to show any lowering of temperature, but responded promptly to salicylates; (3) a microcephalic who ran an irregular high fever did not respond to the drug; (4) the temperature and white blood cell curves parallel each other so closely that one cannot escape the fact that the lowering of temperature is due to diminution of the amount of infection.

13. Antopol, W. and Robinson, H.: Urolithiasis and Renal Pathology After Oral Administration of 2 (Sulfanilyamino) pyridine (Sulfapyridine). Proc. Soc. Exp. Biol & Med. 40: 428, 1939.

Gross, P., Cooper, F. B. and Lewis, M.: Urinary Concretions Caused by Sulfapyridine. Ibid p. 448.

Summary

Observations obtained from six months' clinical experience with sulfapyridine are presented with such reports from the literature as have bearing on the use of the drug and its effect on disease. Our dosage and method of treatment have been outlined.

Sulfapyridine appears to have established itself not only as an effective chemotherapeutic agent for the management of pneumococcal infections but of bronchopneumonia as well, bringing about marked improvement within thirty-six hours despite the duration of the disease prior to treatment. The white blood cell count is the most reliable index of the state of the patient.

Severe upper respiratory infections have responded well to sulfapyridine therapy.

Staphylococcal infections in general are controlled by sulfapyridine, and streptococcal diseases are probably susceptible to its effect. The former will respond better to a combination of chemo- and serotherapy than to either alone.

Infections by Neisserian organisms respond well to sulfapyridine.

All the major toxic effects of sulfanilamide have already been recorded in sulfapyridine therapy.

It is our belief that the drug does not have an antipyretic effect.

The Future of Medicine.—We need have no fears that the development of medicine is at an end. Even though the world be troubled, we may confidently look for peace and satisfaction in the field of medicine, a field which is only at the beginning of possibilities of service and benefit to mankind. That medicine will continue as a profession in the hands of men possessed of individual initiative and of professional ideals, we likewise need have no doubt.—Winfred Overholser: The Broadening Horizons of Medicine, Science, 90:2338 (Oct. 20) 1939.

SOME PROBLEMS OF DIPHTHERIA CONTROL*

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In many sections of the United States diphtheria has decreased to the point that it is no longer a public health or medical problem of significance. This is not so in North Carolina; for during the past five years there have been 10,679 cases and 909 deaths from this disease reported in our state. The case fatality rate has not materially changed, even though the specific death rate has shown a decrease. The questions naturally arise, "Why is this true? Why does North Carolina have nearly 7 per cent of all the diphtheria reported in the United States? Are there factors involved that we have overlooked?" A study of our problem from a number of different angles may disclose some of the reasons why our record is so unsatisfactory.

There seems to be no specific peculiarity of the disease itself in this section of the United States which could account for the large number of cases. According to available records case fatality remains about as it has in this state and is not out of line with that of other sections of the country. Laryngeal diphtheria is still the form of this disease which causes the greatest mortality. As yet there have not been definitely identified in North Carolina cases of diphtheria gravis such as have been reported from time to time in European countries. This type apparently does not respond to the administration of diphtheria antitoxin as does the ordinary case of diphtheria. It is quite likely that this strain of organism produces toxin more rapidly than other strains, which of course would indicate the need for immediate administration of adequate doses of a potent antidiphtheritic serum.

The age incidence of diphtheria in North Carolina runs about as it has for years and as it is found in other Southern states. Dauer,(1) in making a study of diphtheria in the South, concluded that the ages most affected by diphtheria are those of the preschool child. This varies somewhat from findings in some of the Northern states, where older age groups were chiefly affected. We in North Carolina have known for years that the majority of our cases occur in the ages from one to five years; about 55 per cent of all our cases are in this group. Naturally we would expect to find the highest mortality in these same ages; 80 per cent of deaths occur here. There seems to be no significant variation in rural and urban children. Possibly a higher percentage of deaths may be found in rural than in urban children, but this very likely would be due to the lack of prompt medical service when the child becomes ill. There is still an urgent need for prompt and early treatment of all diphtheria cases if we are to get the best results from the administration of diphtheria antitoxin.

Here let me urge not only the early administration of diphtheria antitoxin but also adequate single doses of a potent product. This may be given by either of three routes: subcutaneously, intramuscularly or intravenously. Care should be exercised in order that severe serum reactions may be avoided. Sensitivity tests should precede any administration of serum, whether antidiphtheritic or other.

The only method which will give maximum results in our effort to control diphtheria is proper immunization of the susceptible child or adult. This tells nothing new. The various health departments have been trying to immunize susceptible children for years. In addition, they have tried to educate the parents to the necessity for their cooperation with the family physician. This question arises to plague us: "Have we been immunizing the right children?" It seems reasonable to assume that the public health officer has done what anyone else in his position would do—that is, immunize those who are easy to assemble and who are most easily reached. It naturally follows that children of school ages would comprise this group; and these school children are past the most susceptible ages, so far as diphtheria is concerned. This is not a condemnation of the health officer's efforts, for quite likely diphtheria incidence would have been considerably higher had he not carried his immunization program into the schools. Perhaps

*Read before the Pediatrics Section of the Medical Society of the State of North Carolina, Bermuda Cruise, May 10, 1939.

(1) Dauer, C. C.: Morbidity and Mortality from Diphtheria in the South, Am. J. Hyg. 23:3 (May) 1936.

our recorded decrease in diphtheria in North Carolina in recent years, as compared with the high incidence of earlier years, is due to the immunization of these same school children. If this is true, then we must redouble our efforts to protect the pre-school child as well as continue our control program in the public schools.

If the program of diphtheria control is to be most effective it is necessary to immunize the pre-school child. Furthermore, we should not consider the term "pre-school child" as applicable only to the child who is in his fifth year of life or who is to begin school the following year. The ideal procedure is immunization of each child during his first year of life. The protection afforded by inoculation with toxoid should be confirmed by the presence of a negative Schick test made three to six months later.

The private practitioner is in better position to perform this service for his patients than is anyone else. As was clearly demonstrated last year before this Society in a paper by Doctor Bugg[2] of Raleigh, the family physician is the most important factor in making diphtheria as rare in North Carolina as is smallpox. Should not the family physician be privileged to insist upon parents bringing their babies back to his office for protection against this most devastating disease? The time generally agreed upon as the best for immunization is during the second half of the first year of life. It matters little whether the age selected is at six months or nine months. We must remember that diphtheria does occur under one year of age. Our records for 1938 show that 56 of the 2,442 reported diptheria cases occurred in children under one year of age. The important thing is that immunization be done. The family doctor has a responsibility to fulfill in his capacity as medical adviser to the family and should feel as free to insist upon immunization against diphtheria as he would to insist upon protection by vaccine of those in a family who had been exposed to typhoid fever.

The last General Assembly in North Carolina enacted a law requiring immunization of all babies between the ages of six and twelve months. This measure is a wise public health procedure, and if scrupulously followed, will eliminate diphtheria, or at least make it a rare disease in our state. This should not be such a difficult task, for there would be about seventy thousand babies to be immunized each year. Within five years diphtheria should reach a very low incidence if these babies are protected within the year of their birth.

The choice of an immunizing agent has been somewhat of a puzzle to many practicing physicians. Considerable doubt has been cast upon the effectiveness of alum precipitated toxoid in providing lasting protection against diphtheria. A fairly large number of children have had the disease following its administration. In 1937 we sent questionnaires to every physician in the state who reported a case of diphtheria to the State Board of Health. This was done in an effort to determine the number of children who had previously received one of the immunizing agents. In this connection, I wish to thank the practicing physicians of North Carolina for their cooperation in this study. Because of their assistance a much larger percentage of the questionnaires were returned to us with this information than are usually obtained in such a study. A statistical summary of this information for the year 1937, the period of the study, is presented at this time.

A total of 2,056 cases were reported during 1937. A questionnaire for each case was sent to the reporting physician. A total of 1,516 questionnaires were returned, or approximately 74 per cent. Of this number 237 cases, or 16 per cent, had been previously immunized. Of these 237 cases twenty-five had had Schick tests made. Of these twenty-five who were Schick-tested six patients had positive tests, seventeen negative tests and two unknown. Of those with negative tests six had received toxin antitoxin, two had received toxoid, eight had had alum precipitated toxoid and one was unknown. We are not able to give the lapse of time between immunization of the child and the time when the disease developed. There is a chance, however, that some of those receiving an immunization agent developed the disease before immunity had sufficient time to be established.

(2) Bugg, C. R.: Some Aspects of the Diphtheria Problem, Transactions of the Medical Society of the State of North Carolina, 1938, p. 130.

In a recent report by Volk and Bunney[3] different immunization procedures were evaluated. Their findings indicate that one dose of alum precipitated toxoid is better than two doses of fluid toxoid, giving protection to a greater number and maintaining a higher level of antibody content of the blood for a longer time. At the end of two years 77.6 per cent of children had an antibody or antitoxin level that gave protection. At the end of the first year this was 87.5 per cent as compared with 60.4 per cent for two doses of fluid toxoid. From this study, which made use of controls, it seems wise to continue the use of alum precipitated toxoid. They showed further that after two doses of alum precipitated toxoid the response after four months was 100 per cent. At the time of the report a year had not elapsed; so figures for this group are not available.

McGinness[4] and Gill[5], who made some of the original investigations in this country on the immunizing properties of the alum precipitated toxoid, have unpublished data which indicate that permanent immunity is found in a larger percentage of those receiving this agent than in those receiving other such agents. Furthermore, the investigators who originally threw doubt upon the antigenic properties of alum precipitated toxoid have admitted that their original findings cannot be consistently confirmed.

Conclusions

1. That diphtheria can be controlled and all but eliminated if our present knowledge is applied to the proper age groups.

2. That the family physician should be of the greatest aid to public health officials in bringing about the control of this disease.

3. That alum precipitated toxoid is the antigenic agent of choice, and that two doses administered at three-week intervals is the method of choice.

(3) Volk, V. K. and Bunney, W. E.: Diphtheria Immunization with Fluid Toxoid and Alum Precipitated Toxoid, Am. J. Pub. Health 29:3 (March) 1939.

(4) McGinness, Virginia State Health Department (by personal communication with author).

(5) Gill, Alabama State Health Department (by personal communication with author).

*THE ELECTROCARDIOGRAM AS AN AID IN CARDIAC DIAGNOSIS**

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Within recent years, electrocardiographs have been so simplified that they are coming into general use. It seems timely, therefore, to stress the fact that the cardiogram is only an aid in cardiac diagnosis. The tracings alone should never be used as the sole means of cardiac examination. With the addition of each new instrument of precision to our armamentarium, we are prone to put too much reliance on the technical findings and not to rely enough on our histories and physical examinations.

Dr. Paul D. White starts the section on electrocardiography in his book[1] with the following paragraph:

"The electrocardiograph does not take the place of such other methods of examination as history taking, percussion, auscultation and roentgenology but it does obviate in large part the need of taking mechanical graphic records of arterial and venous pulses and of the apex impulse. Finally, it must be realized that the electrocardiogram may be perfectly normal, even in the presence of serious heart disease. This method of study should therefore be viewed modestly as helpful and supplementary, but not accorded too great importance."

The electrocardiogram will give us valuable information on: (1) the rate and rhythm (2) the size of the chambers of the heart (3) the condition of the conorary arteries, and (4) the condition of the heart muscle.

To appreciate the abnormalities to be shown, we must first know the normal tracing. The configurations of the tracing are produced by photographing the motions of a galvanometer string activated by the heart's current. Motions of the galvanometer string produce different waves, arbitrarily designated by letters. The P wave is that one produced by the contraction of the auricles, the QRS complex is produced by the spread of electrical current over the ventricles, and the T waves are produced by ventricular contraction. Voltage of the different waves (shown by horizontal lines 1 mm. apart),

*Read before the Section on the Practice of Medicine, Medical Society of the State of North Carolina, Bermuda Cruise, May 13, 1939.

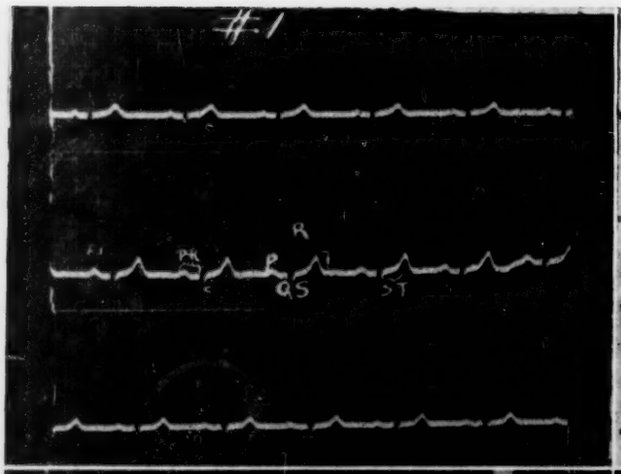
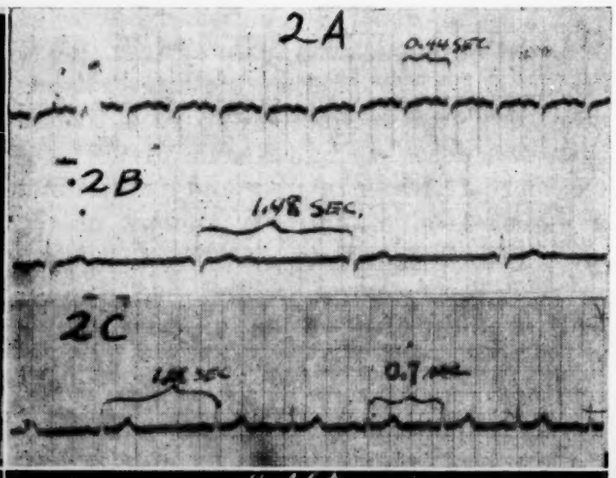
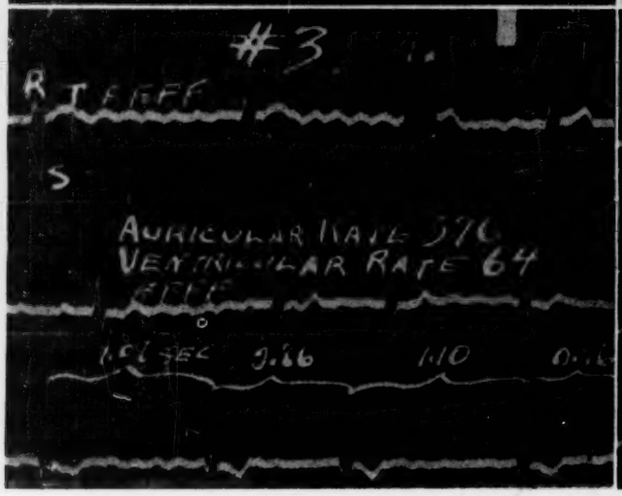


Figure 1, Normal Electrocardiogram.





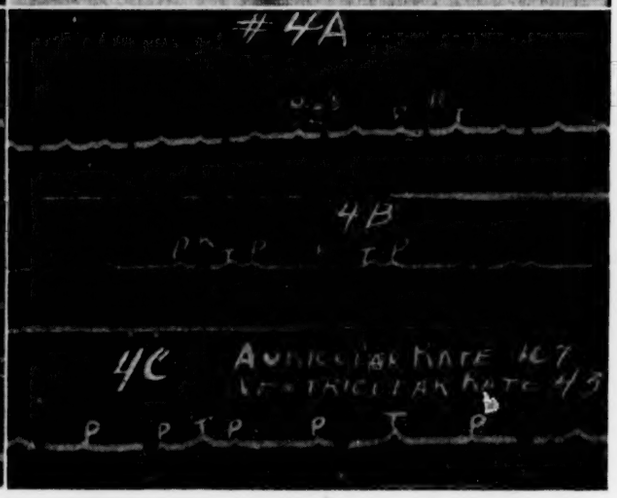


Figure 2, a) Sino-Auricular Tachycardia, b) Sinus Bradycardia, c) Sinus Arythmia.

Figure 3, Auricular Fibrillation.

Figure 4, a) First Degree Auriculo-Ventricular Block, b) 2:1 AV Block, c) Complete Heart Block.

their direction, shape and time relationships (measured by the vertical lines indicating 0.04 second intervals) will vary with different heart diseases. The base line will vary in shape with certain conditions. It is upon these variations in shape, amplitude and time relationships that we interpret our tracings.

Each heart contraction is shown by the combination of waves, P, QRS, and T. (fig. 1). The auricular wave (P) initiates the complex with an upward swing of one to two mm It lasts not more than 0.1 second. Within 0.2 seconds of the beginning of P, the QRS group is shown. This group may begin with a small downward deflection (Q) followed by a large upward excursion (R) of 7 to 17 mm. and then another small downward deflection (S). It must not take more than 0.1 second for this electrical spread to take place. This is followed by the ventricular wave, T. The T wave is a peaked or rounded upward deflection of from 1.5 to 5 mm. and lasting about 0.2 second. This wave is followed by the straight base-line of diastole in which no electrical change takes place.

Disturbance In Rhythm

The impulse stimulating the contraction of the heart originates at the sino-auricular node and such rhythm is known as sinus rhythm (fig. 1). The impulses to beat may originate too rapidly, giving sinus tachycardia, (fig. 2A) or too slowly, giving sinus bradycardia (fig. 2B). The origin of the impulse may be affected by the respiratory phase, giving sinus arhythmia characterized by slowing of heart rate on expiration (fig. 2C). These are the simplest and most frequent arythmias and usually do not signify any cardiac disease. The sinus tachy-

cardia shown occurred in an anemic patient, while the bradycardia was in a patient having a brain tumor with increased intracranial pressure. Auricular tachycardia may be due to disturbance in the nerve mechanism of the heart, to hyperthyroidism, infection, anemias and many extracardiac diseases. Sinus bradycardia, on the other hand, may be due to excessive vagus activity, to increased intracranial pressure and may be present normally in men of the athletic type.

Probably the next most frequent arythmia is auricular fibrillation (fig. 3). In this state the sino-auricular node does not originate the impulse to beat, but the auricular wall is in circus-like movement sending impulses to the ventricles at the rate of 350 to 500 per minute. Naturally, the ventricles are unable to respond to this rapid rate and respond irregularly with systoles. These tracings show an absolute lack of rhythm in ventricular activity and a wavy, irregular base line representing the fibrillation of the auricles. Practically always, this arythmia means a diseased auricular myocardium, be due to poor coronary circulation, to hyperthyroidism, to toxicity as in pneumonia or to arteriosclerosis.

Auricular flutter sometimes precedes fibrillation. In this condition, the auricles are beating rapidly and regularly as shown by flutter waves in the base line of the tracing. The ventricles are unable to respond at so rapid a rate, so that there is an auriculoventricular block in the ratio of 2:1, or 4:1. Flutter may be a toxic response but is usually due to a diseased myocardium.

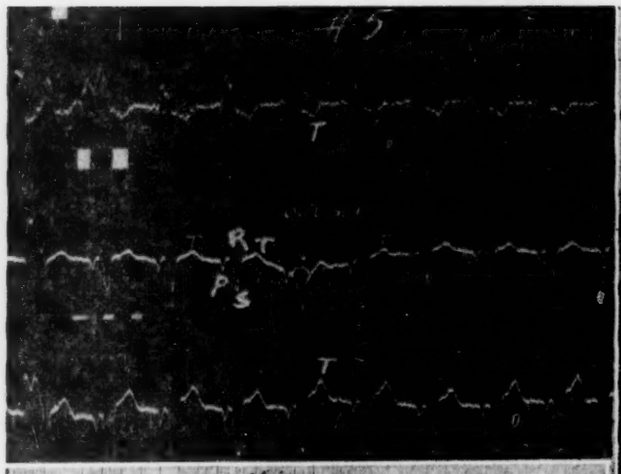
Toxic processes, inflammatory reactions and fibrosis of heart muscle affect the conducting mechanism, producing varying degrees of block (fig. 4). The first degree is shown by a delay of more than 0.2 seconds in the conduction of the impulses from the sino-auricular node to the ventricle (4-A). Such a blocking is often present in many infectious processes, particularly in active rheumatic fever. Arteriosclerosis is also a frequent producer of varying degrees of block. In a higher degree of AV block, the ventricle fails to respond to a half or a third of the auricular impulses. Thus the tracing will show P waves at regular intervals and QRS complexes following every second or third P wave. The block shown here (4-B) was produced by toxic action of digitalis. In severe toxic states and in marked myocardial disease, there may be a complete dissociation of auricle and ventricle, the auricle beating at one rate, the ventricle at another, and the ventricular systoles showing their ventricular origins by slow rate and prolonged QRS phases. This figure (4-C) shows complete block due to a diphtheritic myocarditis.

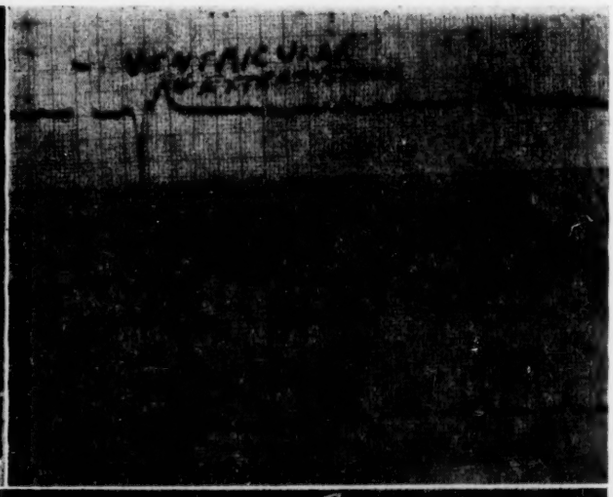
The conducting bundle of His may be so affected with scarring, fibrosis, or inflammatory processes that the spread of the impulses over the ventricles is delayed longer than the normal 0.1 second (fig. 5). Without characteristic axis deviation, this is known as intraventricular block. If the left bundle branch is more involved, the above description holds true and is accompanied by an inverted T/1 with left axis deviation. In right bundle branch block, T/1 is upright, T/3 is inverted and there is a right axis deviation. Any form of intraventricular block must be regarded very seriously although it is possible for patients with this lesion to live comfortably for many years. It is usually due to coronary arteriosclerosis or to syphilis.

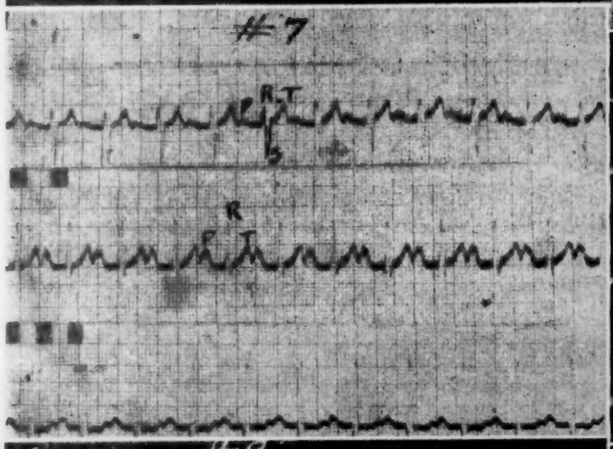
Extrasystoles, either auricular or ventricular, frequently produce an arythmia of which patients complain (fig. 6B). When the extrasystole is auricular in origin, the P wave is present, but it may differ from other P waves shown in the strip. After it, comes a ventricular QRS complex like all the others. The compensatory pause after an auricular extrasystole is usually a little shorter than after a ventricular extrasystole. Aberrant beats arising in the ventricular muscle show a different QRS and T (fig. 6A), being usually larger and of longer duration. In themselves, these abnormal beats do not necessarily mean a diseased heart muscle, but they do imply the presence of an irritable focus in either the auricular or ventricular myocardium. They are frequently detected in the presence of chronic intoxications as from excessive use of tea, coffee, tobacco, alcohol, and from chronic focal infection. They also occur frequently in the presence of myocardial disease.

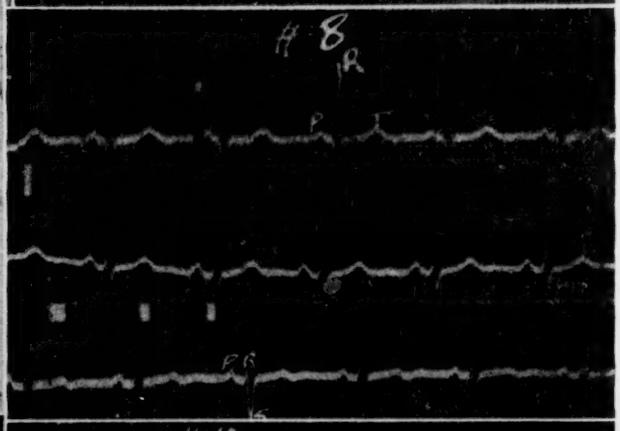
Changes in Size of the Chambers of the Heart.

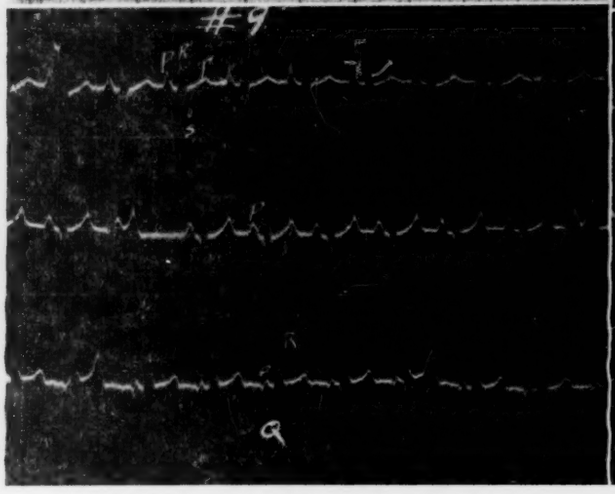
As we have seen before in the normal heart, (in which the ventricles and auricles are relatively proportionate), the main











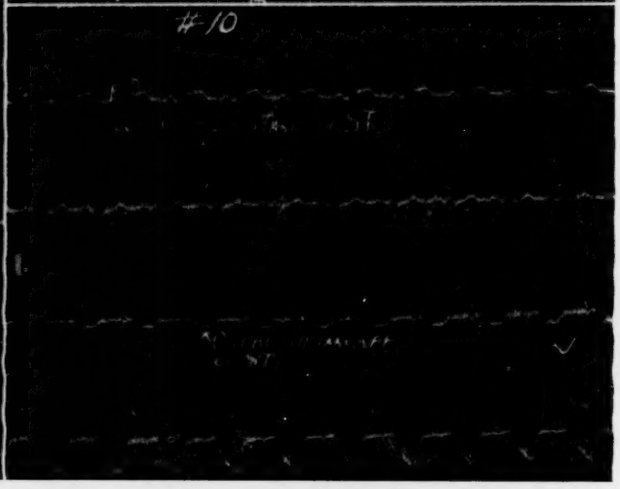


Figure 5, Intraventricular Block.
Figure 7, Large P Waves.
Figure 9, Right Axis Deviation.

Figure 6, Extrasystoles a) Ventricular b) Auricular.
Figure 8, Left Axis Deviation.
Figure 10, Early Conorary Occlusion.

swings of the QRS groups are directed upward. With hypertrophy of one ventricle there will be a rotation of the heart's electrical axis toward the enlarged ventricle. This rotation produces a deviation of the axis of the QRS groups, so that in right axis deviation (fig. 7), the main swing of the QRS group is downward in lead one—i.e., the voltage of the S wave in lead one exceeds that of R/1. In right axis deviation lead two will be approximately an average of leads one and three. Lead three will have its main swing in an upward direction. This finding is quite constant in both mitral stenosis of rheumatic heart disease and in obstruction to the pulmonary circulation, both of which conditions produce right ventricular hypertrophy.

Left axis deviation is shown (fig. 8), by an upward swing of QRS in lead one with a negative deflection of that group in lead three—i.e., S/3 has a greater voltage than R/3. This finding is frequent in left ventricular hypertrophy due to hypertension, mitral insufficiency or aortic valve disease.

Hypertrophy of the auricles does not produce any axis deviation but shows itself in abnormalities of the P waves (fig. 9). These waves will be of abnormal height, (over 2 mm.), of longer duration, (more than 0.1 second) and will probably be notched. Such waves are frequently seen in mitral stenosis and in obstruction of the pulmonary circulation.

Axis deviation may, in some cases, not indicate hypertrophy. The build of the patient and the patient's position while the tracing is being made may influence the axis. Thus, a very thin subject may have a right axis deviation with no heart disease, while a left axis deviation may normally be present in obese subjects.

Hypertrophy of itself does not imply a weakened myocardium, but merely an effort on the part of the heart to overcome a mechanical obstruction. So long as we have only axis deviation present in the tracing we may say that the heart muscle is sound.

Occasionally, we may see a heart greatly enlarged and not showing any axis deviation. This is likely to occur when both sides of the heart are equally enlarged as in advanced arteriosclerosis and hypertension. Left axis deviation is usually present however.

Diseases of the Coronary Arteries

The electrocardiograph's greatest use lies in the detection of coronary artery occlusion and coronary artery disease. Here we have definite findings in approximately 80 per cent of patients with this condition.

Within a few hours to a day or two after an acute occlusion, definite changes take place in the ST segment (fig. 10). Instead of passing from S to T level with the base line, this segment will pass directly from about the mid-portion of R or S to T, so that this segment is elevated above or depressed below the base line. Usually when the ST segment is above the base line in lead one, it will be below in lead three, and vice versa. These changes usually are accompanied by a deep Q wave either in lead one or three. Anterior infarction is shown by an elevated take-off of ST, with a depressed take-off of ST/3 accompanied by a deep Q/1. Posterior infarction is shown by the opposite—i.e., a depressed take-off of ST/1, elevated take-off of ST/3 and a deep Q/3. These abnormal take-offs persist for several days.

As healing occurs, the ST segment tends to approach a level with the base line (fig. 11). This leads to the production of the "Coronary T wave". This is characterized by an upward convexity in the ST segment leading to an inverted T wave. In anterior infarction this abnormal T wave is found in leads and and two. T/3 is directed upward. Posterior infarction produces an opposite effect—i.e., the ST convexity and the inverted T wave is found in lead three and T/1 is upright.

As years or months go by, these coronary T waves may be replaced by normal ones, but frequently they persist.

Coronary artery disease may be implied by signs of myocardial disease, of which, more later. A deep Q/3 (fig. 12) is frequently found in patients having coronary artery sclerosis and in those having angina pectoris. To be considered deep, Q/3 must be 25 per cent or more of the greatest excursion of QRS in any of the three standard leads. A deep Q/1 would probably have the same significance.

Unfortunately, the electrocardiogram shows nothing typical in angina pectoris. During an attack a tracing like that described for acute occlusion may be found, and a normal tracing may be obtained an hour or so after the attack. A deep Q/3 must be considered strongly suggestive of angina.

Changes Due to a Diseased Myocardium

Under previous headings we have mentioned several of these electrocardiographic signs of a diseased muscle—namely, auricular fibrillation, AV block, intraventricular block, bundle branch block, coronary T waves and deep Q waves.

Further evidence of myocardial disease is obtained from the appearance and voltage of the QRS groups and by the amplitude and direction of the T wave.

Notching or slurring of QRS (fig. 13) in a complex of low voltage may not be significant, but when it is present in a complex of average amplitude, particularly if it is accompanied by any other abnormality,

we may safely say that the myocardium is diseased. This finding is usually permanent and occurs in rather diffuse myocardial fibrosis.

Recall that the normal voltage of the QRS complex varies between 0.6 and 1.7 mv. The amplitude of the QRS complex is determined to some extent by the functional state of the heart muscle, but it is generally believed that voltage of over 1.7 mv. is an indication of hypertrophy when no notching is present in the swing. Voltages below 0.5 mv. (fig. 14) always indicate a diseased heart muscle. To be significant, the low voltage must be present in all three leads—i.e., if the QRS complexes are low in one lead only and the voltage is adequate in the others, no significance is attached to the finding. Hypothyroidism frequently produces low voltage of

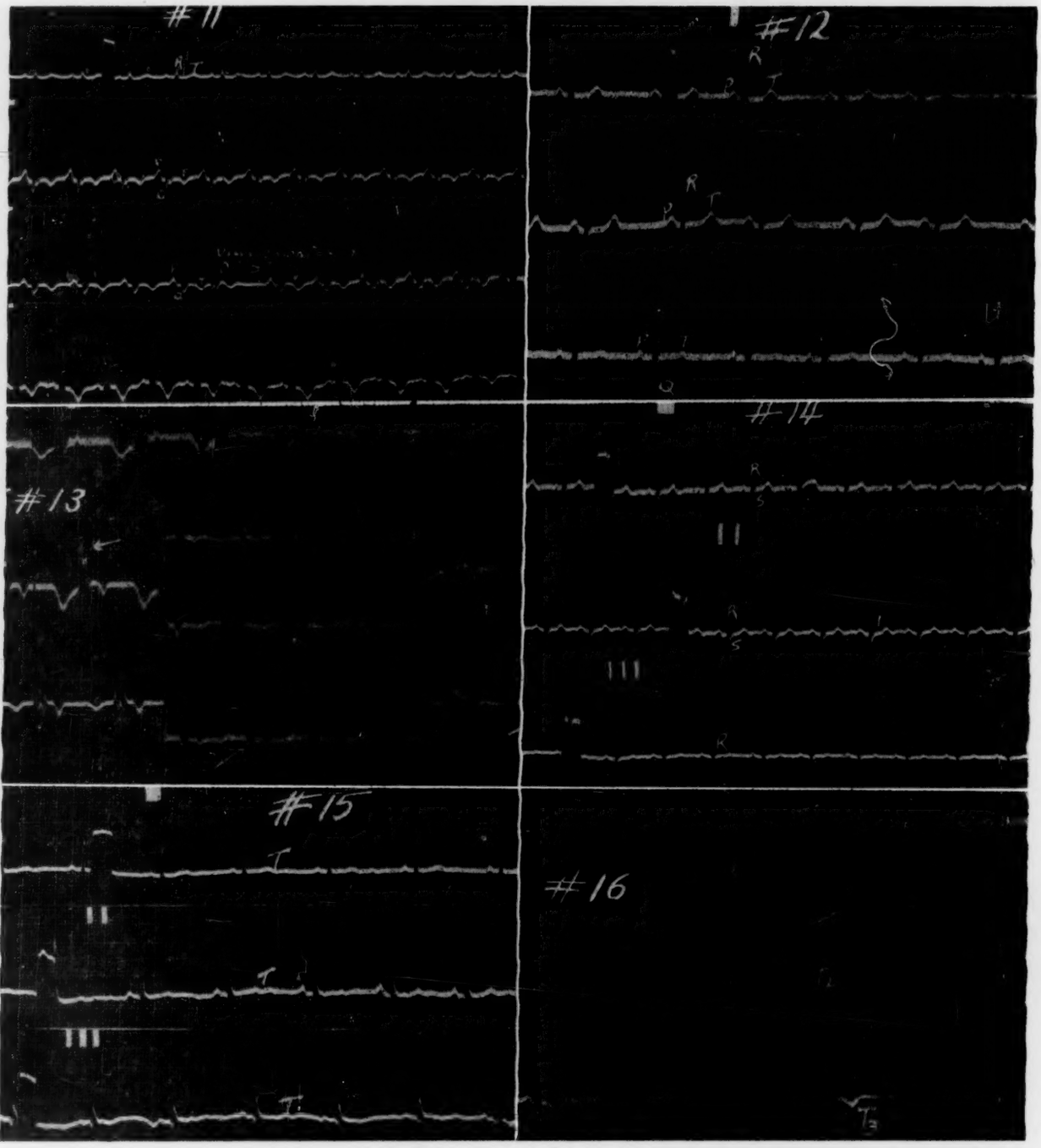


Figure 11, Coronary T Waves.
Figure 13, Notching and Slurring of QRS.
Figure 15, Low Voltage of T Waves.

Figure 12, Deep Q/3.
Figure 14, Low Voltage of QRS.
Figure 16, Inverted T/2.

QRS. Generalized myocardial fibrosis will frequently cause the same thing.

The amplitude of the T wave is also partly dependent upon the functional state of the heart muscle, normal varying from 0.15 to 0.5 mv. (fig. 15). Here too, the finding of a low T wave, in one lead only, is insignificant. If however the voltage is below 0.15 mv. in all three leads we must say that the myocardium is impaired. A still more significant finding is the inversion of T in lead one or two (fig. 16). This always means a diseased myocardium unless it occurs in an extrasystole.

Conclusion

An effort has been made to review some of the commoner electrocardiographic abnormalities with the purpose of showing what we may learn from an electrocardiogram. We may say that its greatest value lies in:

(1) detecting coronary occlusion and coronary artery disease, (2) determining the rhythm, and (3) estimating the condition of the heart muscle.

The making of a tracing gives little more information than the stethoscope in the study of valve lesions. In studying the condition of the heart muscle we are frequently able to evaluate more accurately an operative risk. The electrocardiogram is a great *aid* in cardiac diagnosis, but no diagnosis should be made on it alone.

Discussion

DR. VERNE S. CAVINESS (Raleigh): Mr. Chairman and Gentlemen: I have enjoyed Dr. McNeill's paper very much. He has given us a concise covering of the subject, and it is a subject which is becoming of more widely recognized importance.

I think that the chief and perhaps the most valuable point that he has made is the necessity for coordination in this branch of medicine, as in all others, between the laboratory and the clinical findings. I don't think we are justified at any time in taking the clinical stethoscopic and exercise tests, and the history of the patient, without adding the caridogram if the patient has a very definite cardiac disease or symptoms.

There are a number of factors that have to be considered. Sometimes, I think the type of machine receives too much importance. A good workman never blames his tools. But I do think that there are variations in machines, and that these variations in the type of tracing made must always be considered in interpreting and evaluating the results.

The technique in making the tracings is very important and requires a great deal of attention. A tracing can be made which is utterly valueless, or one can be made which is perfectly good. One thing that must be remembered always is the standardization of the string, if you use a machine that has a string. The interpretation and evaluation of the results of tracings, however, are far more important than the actual technique of making the tracings.

Dr. McNeill stated the chief value of the cardiogram is the evaluation of the functioning of the heart muscle. There is no other way of making such an accurate evaluation of the qualities in the heart muscle. If this is adhered to, and if we make a careful cardiographic study of all suspected cardiac cases, I think it would be of great help to the neuro-psychiatrists. All of us have seen many patients who were told they had heart trouble and were made permanent neurotics by misinformation. Frequently, these patients have no heart trouble, and it is difficult later to convince them of the fact that they have been misinformed in the beginning.

Checking treatment is a point at which we can make good use of the cardiograph. When a patient is first seen, we frequently find that he has been taking large amounts of digitalis and shows effects of digitalis poisoning which, at times, even the best of clinicians can confuse with definite heart disease in the cardiograms, unless they make a very careful interpretation. I am sure all of us remember life insurance scandals of that sort that occurred relatively recently.

To those of you not familiar with the making of the cardiograms, lead one is the difference in electrical potential between the right arm and the left arm. Lead two is the difference in electrical potential between the right arm and the left leg. Lead three is the difference between the left leg and the left arm. The fourth lead, or multiples of that as desired, is the difference between the chest and one arm or one leg.

From this I think you can see it is relatively easy to get a change in electrical potential. In drawing up instructions for the making of cardiograms, you cannot presuppose abnormal positions of the heart or variations in the position of the body. A tranverse heart will give quite a different tracing from a vertical heart. I mention that to show the importance of giving careful consideration to all your clinical findings, as well as to interpretations of the cardiogram itself.

Cardiograms have great value in other ways. When a patient passes the age of forty, begins getting into the age of arteriosclerosis and the other chronic degenerative diseases, and comes up for an elective surgical operation, the mortality rate can be greatly reduced by a careful study of the circulatory system. Various hospitals have reduced their operative mortality practically to zero in various types of operations by refusing to do elective operations on patients who have definite indication of coronary sclerosis, or other heart disease.

DR. WILLIAM B. DEWAR (Raleigh): Possibly my greatest pleasure with cardiographs has been helping people who do not have organic heart disease. The patient who may have the syndromes, after a complete study of that case, including history, laboratory findings, with careful physical examination can often be rehabilitated and sent back to hard work.

DR. McNEILL: One of the points made by Dr. Dewar was the need for reassurance. So often we see patients under emotional stress, with dyspnea on effort, who have been told that they have a bad heart. They suffer from that diagnosis for months on end, sometimes years, and it is awfully hard to convince them that they don't have honest-to-goodness heart disease. I believe a cardiogram is our best means of doing that.

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Editorials

BY WAY OF INTRODUCTION

With this issue the NORTH CAROLINA MEDICAL JOURNAL becomes the official organ of the Medical Society of the State of North Carolina. It will go to every member of the Society, the subscription being included in the regular dues. In this its first number we, the members of the editorial board, wish to outline the policy of the magazine so far as possible — bearing in mind that it is a newly born infant and that its features may change greatly as it reaches adolescence and maturity.

The mission of the NORTH CAROLINA MEDICAL JOURNAL is to serve as a medium for North Carolina doctors to use in exchanging ideas; as a purveyor of worthwhile medical information, whether from our own members or from guest speakers and writers; as a means of contact between the president, the secretary, and other officers and members of the society; as a permanent record of research by society members; and as a news letter about the interesting doings of North Carolina doctors. Irvin Cobb's famous criticism of North Carolina as needing a press agent applies with peculiar force to its medical profession. From first hand acquaintance we know that the doctors of this state will compare favorably as a profession with those of any state in the union; but most of them have been too modest about expressing themselves. It is our hope that this magazine will stimulate a goodly number of North Carolina doctors to let their light shine more brightly before men.

For its material, the journal must depend upon a number of sources. All papers read before the State Society are, of course, its property; but these will not be nearly enough. We hope to get some valuable contributions from guest speakers who come to our state. We also expect to use the best of the papers read at district and county meetings. We shall depend upon our medical schools and our hospitals for reports of worth-while clinics, clinico-pathological conferences, and research work. Last, but by no means least, we shall look to the individual doctors throughout the state for instructive case reports and interesting news notes.

While, for many reasons, it will be impractical and impossible to print all material submitted, every contributor may be quite sure that his offering will be given a sympathetic reading by at least two men. If they disagree as to its merits, a third will cast the deciding vote. In order to do justice to papers submitted to the journal, every member of the editorial board has promised to help. In addition, the board has appointed a number of unofficial associate editors to represent every special branch of medicine as well as general practice. The names of these men will not appear on the masthead, but they will render a real service, nevertheless.

Every doctor in active practice should have from time to time interesting and instructive cases to report; bits of practical technique to pass on to others; observations worth organizing into papers for the state, district, or county society, to be submitted as a matter of course to this journal. We want every member of the Medical Society of the State of North Carolina, veteran or fledgling, college professor or intern, to feel that the NORTH CAROLINA MEDICAL JOURNAL belongs to *him*. It is the organ of the whole Society, and its success—let us not suggest any other outcome—depends upon the wholehearted co-operation of the entire membership.

THE NORTH CAROLINA MEDICAL JOURNAL AND THE AMERICAN MEDICAL ASSOCIATION.

One ambition of its editorial board is that the NORTH CAROLINA MEDICAL JOURNAL may serve to strengthen the ties between our State Society and its parent, the American Medical Association. As a first step toward this aim, we are happy to present in this first issue greetings from the four most prominent officials of the American Medical Association: Dr. Rock Sleyster, President; Dr. Nathan B. Van Etten, President-Elect; Dr. Morris Fishbein, Editor of its Journal; and Dr. Olin West, Secretary and General Manager. To each of these we wish to express our sincere thanks for their words of counsel and cheer; and we pledge them, as heads of the A.M.A. family, North Carolina's unwavering loyalty.

* * * *

GREETINGS

NORTH CAROLINA MEDICAL JOURNAL

The American Medical Association has always regarded with pride and satisfaction the growth and progress of the constituent society of North Carolina. Under difficulties not experienced by all of its children, the Medical Society of North Carolina has developed in quality of membership, in educational facilities, and in constructive programs well carried out, to an envied position among the leading societies of this country.

Now, the A.M.A. welcomes to the official family of Journals one of its progeny—a new-born, christened "North Carolina Medical Journal". This medium will afford opportunity to give expression to scientific progress in the treatment of disease and to those advances and activities carried on for the protection of the health of the people of North Carolina. This new Journal will be a champion of ideals. It will be a defender of those established policies so necessary to insure to the people of this great state the highest standards of medical service.

ROCK SLEYSTER, M.D.

* * * *

A NEW MEMBER FOR THE DISTINGUISHED COMPANY OF STATE MEDICAL JOURNALS

More than twenty-five years ago, when I first became assistant to the editor of *The Journal of the American Medical Association,* the state medical journals had already begun to adopt scientific and ethical standards in relationship to their advertising. Few of them, however, were distinguished for scientific and editorial competence. More and more, as the years have passed, it has become apparent that physicians of the constituent state associations of the American Medical Association were beginning to recognize the importance of the state medical journals as leaders in the field of medical thought.

Today there remains but one of the state medical journals which fails to follow the standards of the various scientific councils of the American Medical Association in its acceptance of drugs, foods, and physical devices which are of known composition or contruction, and promoted with established claims.

Moreover, practically all the publications which now represent the constituent state associations are the property of these associations rather than of any private publishing agency. With sound scientific management and with the assistance of the Cooperative Medical Advertising Bureau, they are published not only without excess cost to the state medical associations, but in some instances actually yield a profit, which is of service in promoting scientific and public relations work of these societies.

An editor who studies these periodicals will realize that they do not follow any fixed pattern in composition, makeup, or style. They are, indeed, as individual in their appearance and in the nature of the material which they present as are the states themselves. There is reason to believe that the state medical journal of North Carolina will be able to reflect as well, the personality and the character of the medical profession of that state. North Carolina is also to be congratulated on the acceptance of the editorship by Dr. Wingate M. Johnson, whose writings have already received national recognition by inclusion in periodicals, both popular and scientific, of national circulation.

North Carolina is welcome to the family of state medical journals, coming at a time when that family has emerged from its original state of poverty and comparative illiteracy into an aristocratic assemblage of erudite and financially competent journals!

MORRIS FISHBEIN, M.D.

CALL THE DOCTOR

Society is sick, suffering, cold, hungry, senile, frightened. Unhealthy desires fanned by hot currents of discontent make life increasingly hazardous. Overactive glands are producing a hypertensive, unstable, inflammable race. Oblique morals, fragile nerves, unsound minds, all diseases of civilization common to man alone of all animals are filling hospital beds. While the same forces push some to the frontiers of genius, others who are meshed in lower gears bog down to dead levels of mediocrity or unemployable indigency.

Fifty years of modern medicine have salvaged so many that the average life expectancy is now sixty-two years. At the same time reproduction is attended with difficulty. Ten per cent of marriages are sterile and there is no evidence that replacements are of stronger quality. Too many young mothers die; too many children fail to attain a strong maturity; too many hearts fail to keep step with modern speeds; too many malignancies destroy young adults; too many people between the ages of thirty-five and sixty-five are limping along with incapacities.

In the midst of this dismal picture occur so many colorful stirrings by groups and individuals that hope still lives.

Christopher Morley said recently "One astonishing phenomenon has become plainly manifest; the obvious reluctance of civilization to tear itself to pieces". "I think it the greatest tribute to civilization that if it should perish it will do so reluctantly".

With a promise of recovery it is time to call the doctor. If civilization improves the doctor will have to do much more than patchwork and protective immunization. He will have to concern himself with studies of personality, psychiatry and eugenics. Generations of thoughtful mating under the inspiration of the doctor will surely help; meanwhile the foundations must be laid by the doctor. He must educate youth physically and morally. He must be vigilant in helping the poor to help themselves. He must ease the path of low income people without lowering their morale. He must fight every degenerative disease. He must work out formulae for rehabilitating the victims of the industrial machine. He must keep himself upon a high plane and he must take the directing place in society for which his education qualifies him. His optimism must be stimulated by knowledge of the historic fact that for two thousand years his predecessors who swore to carry on the Hippocratic tradition have survived the rise and fall of many civilizations.

Again and again they have responded to the call for the altruism which has preserved their identity. The new voice which is to speak in North Carolina will be heard by many doctors in city and country—let us hope that it will awaken them and that they will answer the call with all the strength of mind and character which they possess.

Speaking for all whom I may represent I welcome the advent of the NORTH CAROLINA MEDICAL JOURNAL most heartily. I am confident that it will be a great success under its so distinguished leadership.

NATHAN B. VAN ETTEN, M.D.

* * * *

TELEGRAM FROM DR. OLIN WEST

The Medical Society of the State of North Carolina has taken an important forward step in establishing its own journal. I am sure that the journal will make great contribution toward the promotion of the art and science of medicine and the betterment of the public health in your state. I congratulate the Medical Society of the State of North Carolina on having taken this progressive step.

OLIN WEST, M.D.

* * * *

THE NATIONAL COMMITTEE FOR THE EXTENSION OF MEDICAL SERVICE

During the "five years of persecution", as Dr. Rock Sleyster aptly termed the systematic drive made by the Federal government to force some sort of political medicine on the people of the United States, the American Medical Association has often been criticised by its own members for not fighting back hard enough. Many doctors and friends of doctors have felt that there has not been enough effort made to present the cause of organized medicine to the people. This criti-

cism has had just enough justification to give point to Hambone's observation that "A lie don't hurt a man as much as when a lettle bit of truth git out on him."

There have been more reasons than were apparent on the surface, however, for this attitude on the part of A.M.A. officials. One reason is that it would have required far greater financial resources than the Association has to combat the unlimited funds at the disposal of the government-inspired propagandists. Another reason is that for the A.M.A. officially to have entered the arena of political lobbying would have made it liable to the loss of most of its revenue by the income tax route.

The long-felt need for an articulate body to fight for the justice of our medical ideals in a practical way has been met by the organization of the "National Committee for the Extension of Medical Services". While this group has no organic union with the American Medical Association, its executive board and central committee are composed of men whose loyalty to the cause of organized medicine has been tested in innumerable ways over many years. A number are past presidents of the A.M.A. The chairman of the Executive Board is that grand old war horse, Dr. Edward H. Cary, of Texas, for years Chairman of the Association's Committee on Legislative Activities.

Naturally this group must have money in order to carry on its work effectively. Appeals are being made to physicians and their friends for financial support. Besides giving money, doctors and their friends can be of great help in fighting the threat of political medicine, by reminding their Senators and Representatives that socialized medicine was born in Russia and Germany, and was the entering wedge for totalitarianism in both those countries.

Let all who are interested in opposing the menace of political medicine support in every possible way this organization—and thus let the people of America know that organized medicine is dynamic, not static.

* * * * *

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The charge has been made over and over, within as well as without the ranks of the American Medical Association, that organized medicine has adopted a dog-in-the-manger policy in the matter of securing a wider distribution of medical care to the American people. We have been told that, unless we have something constructive to offer, we should not attempt to obstruct such plans as were embodied in the Wagner (so-called) Health Bill.

Whether or not there is any foundation for such a charge, it should now, in justice, be withdrawn. At the annual meeting of the state secretaries of the A.M.A. held in Chicago, November 17 and 18, there was announced "The Platform of the A.M.A." This platform has been given all possible publicity, tnrough the lay press and otherwise. Most of our readers have seen it long ago, and many may have it hanging in their offices; but it will do no harm to reproduce it here.

The American Medical Association advocates:

1. The establisment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

It will be noted that every point made is positive; there is not a negative note in the whole document, yet it represents the consensus of opinion of the House of Delegates, speaking for the 115,000 members of the A.M.A. It certainly should put to rest the time-honored lie that that body is purely reactionary.

CASE REPORTS

A CASE OF AGRANULOCYTOSIS*

W. M. B. BROWN, M. D.

GREENVILLE

The etiology of Agranulocytic Angina is still unknown; Kracke and Parker(1) have written the most comprehensive article on the factors supposedly concerned in its causation. These two investigators emphasize that it occurs mostly in middle aged women, was a rarity before 1922, and is unknown in negroes. They give suggestive evidence that a drug containing the benzine ring such as amidopyrine, may be an important factor. It is also known to occur occasionally in the course of prolonged infections. V. L. Bolton(2) suggested that possibly the granulopenia of Agranulocytic Angina is due to transformation products of certain drugs which may in susceptible subjects cause arrested maturation of the myeloid elements of the bone marrow.

This case of agranulocytosis is presented to add to the series of cases that have not taken amidopyrine or barbituartes; the history of the patient, patient's family, and the family doctor prove beyond a doubt that she did not take drugs of that series. Even when a tooth was extracted she was given codeine. Several other case reports give a history of having a tooth extracted several weeks or months before an attack of agranulopenia as did the case I am reporting.

The patient was a single, white woman, age 43, school teacher. I was asked to see this patient in consultation with a local dentist on the morning of April 28, 1938, at her home. She gave a history of having had a wisdom tooth extracted on January 14, 1938, and had noticed a spur on the gum where the tooth had been removed, about two weeks previous to my first examination. She returned to her dentist one week later and he removed the spur with a sharp curette. About three days later the patient developed a sore throat which she treated by means of home remedies, while continuing to teach. On the morning when she was first seen by me, she was complaining of severe sore throat, high fever, inability to swallow, and loss of sleep the night before. I immediately sent her to Pitt Community Hospital and had Dr. D. B. Armistead see her.

Past history was essentially negative, the patient having had the usual childhood diseases. She stated that she had felt run down and weak all the winter, but had kept on with her work.

Physical examination showed a white female who appeared critically ill and in a state of collapse. Respiration was very rapid and labored. Her pupils reacted to light and accommodation, and were equal. Fundi were normal. Examination of nose and ears was negative. The entire pharynx and fauces showed extremely marked homogenous inflammation and edema. A grayish-white membrane was noted over the left posterior pillar and pharyngeal wall. The membrane was friable and easily removable. The anterior cervical glands showed great tenderness and swelling. Both the teeth and gums were in fair condition. There was no rigidity of the neck. Examination of the heart showed apex in 5th interspace 8½ cm. from mid sternal line; no cardiac enlargement; ;rhythm regular, rate 120. There were no thrills nor murmurs. A few scattered rales were heard over the bases of both lungs. B.. P. 86-60.

Laboratory examinations were as follows: Spinal puncture showed pressure normal and water-clear fluid, the cell count being normal. Urine: specfiic gravity 1030, acid, 2+ albumin, occasional W. B. C. A blood smear was negative for malarial parasites. The hemogloblin was 52% with red blood cell count 2,900,000. The leukocyte count was 1,000 with polys O, small lymphocytes 30%, large lyphoytes 70%. The following day the leukocytic count was 1,600 with polys 1%, small lymphs 26%, large lymphs 73%.

Treatment consisted in the administration of parenteral glucose and normal saline, ice collar, pantapon for pain, liver extract, oxygen, blood transfusion, and pentnucleitide; however, the patient failed to respond and died on the third day after admission to the hospital.

Discussion

DR. C. N. PEELER (Charlotte): How old was she, Doctor?

DR. BROWN: Forty-three.

DR. PEELER: That makes me think of one of our colored nurses who caught a cold. About two months ago, she caught a cold at home and developed influenza. She used the home remedies, treated herself. She worked for Dr. Bottomley. He went out to see her, gave her codeine and some aspirin to make her comfortable, and thought she would be all right. From the influenza, she developed a pneumonia, bronchial type. She had consolidation following that. An internist treated her and typed the infection and gave her the serum. In the meantime, she had had some sulfanilamide —I don't think a great amount. Her blood picture began to go down—hemoglobin, polys. and total white count. Her red count at the beginning was good. The white count, something like 15,000, went down to 7,000, then to 5,000, and on down to 1500, with a decrease in the neutrophils, too.

All medication was stopped and supportive measurse used. .She graduaily pulled out of it. Her white count went to 800, but after two transfusions, she finally started to improve.

CHAIRMAN PEERY: The rarity of agranulocytosis in the colored race would make one think how much that sulfanilamide depressed her.

DR. PEELER: Whether the sulfanilamide was responsible or not was the question. I remember she had eighty dollars' worth of the serum during the treatment for the pneumonia.

In that connection, I might report a case of my own that I just dismissed a few days ago. This child was twelve years old, and developed a sore throat. She had her tonsils and adenoids. She had a mild sore throat, and then she developed large glands on both sides. She was sent in at nine o'clock on Sunday night. I couldn't get to do any blood work. She had been given five grains of sulfanilamide by her family doctor before he sent her in. She had a temperature of 104, with a chain of glands on both sides greatly enlarged. She had very little redness of her throat. So I put her on

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*Read before the Section on Ophthalmology and Otolaryngology of the Medical Society of the State of North Carolina, May 18, 1939.

(1) Kracke, R. R., and Parker, F. P.: The Relationship of Drug Therapy to Agranulocytosis, J.A.M.A. 105:960 (Sept. 21) 1935.

(2) Bolton, V. L.: Laboratory Study of Amidopyrine, Barbital, Phenyl Hydrazine and Benzene in Relation to Agranulocytic Anginia, J. Lab. & Clin. Med. 20:1199, 1935.

sulfapyridine, not knowing the infection. The next morning I had a complete blood count made, which showed 7800 whites with 78 per cent polys. So I immediately cut down my drug. The next morning her temperature was around 100; blood picture, 1700 whites, 18 per cent polymorphonuclears, and her hemoglobin and red cells had decreased a great deal. The third morning the white cells were about the same—but her polys were 8 per cent. She was looking good. Her color had improved. She was beginning to eat again and was sleeping very well. The glands of her neck had gone down considerably. Next morning her polys. were 4 per cent. We kept her in the hospital a week. When she went home, her polys were 17 per cent. She came back in a week, and the blood picture had improved still more. The polymorphonuclears were 27 per cent. I have not seen her since.

It was very interesting to me. She did not get a great deal of the drug, but when she returned a week later, she looked like a well girl, except for the blood pressure. I follow the rule that I do not give powerful drugs, such as sulfanilamide, except in the hospital where I can get a picture of the blood every day.

STAB WOUND OF HEART

A. HINSON, M.D., F.A.C.S.
Davis Hospital
STATESVILLE

G. M. — Age 28; color, black; occupation, mill work.

PRESENT ILLNESS: Patient stated that he was stabbed in the upper left chest by a colored man ten minutes before admission. There had been very little bleeding from the wound, but he felt very weak and had trouble breathing. Patient was conscious and answered questions properly.

PHYSICAL EXAMINATION: Patient was a very apprehensive colored man of 28 years who was having extreme dyspnea. Weight—estimated 160 pounds. Blood pressure could not be obtained. Temperature 98 degrees. Pulse imperceptible. Scalp and skin aparently normal. Lips, tongue and conjunctiva cyanotic.

Ear, Eye, Nose and Throat—Pupils equal and regular, and react to light and distance. Mucous membranes slightly cyanotic.

Respiratory System — Respiratory rate 28 per minute. Percussion showed an enlargement of the entire heart towards the left and right. Pulse was imperceptible. Heart sounds were very faint and distant. There was a small stab wound in the left chest just lateral to the sternum in the 4th interspace with a slight amount of bleeding from the wound.

The abdomen was flat. No masses were palpable. No tenderness was present.

Nervous system—Patient extremely apprehensive. Patellar and biceps tendon reflexes sluggish.

CLINICAL LABORATORY:

Fluoroscopic examination of the chest showed a pneumothorax to the left with some haziness in the lower part of the chest. Heart shadow was greatly enlarged and of the water bottle type. In the central portion of this there was a clear area suggestive of air in the pericardium. There was very little motion to be seen in the heart.

Specimen of urine could not be obtained.
R. B. C. 4,700,000
Hemoglobin 100%
W. B. C. 13,000
Polys. 86%
Lymph. 16%
Eosinophils 1%
Myeloblasts 2%

Patient was immediately typed for blood transfusion, and 2000 cc. of 5% glucose in saline was given intravenously.

Electrocardigraphic findings before operation showed no definite abnormalities.

Patient was taken to operating room immediately.

OPERATIONS AND FINDINGS:

Anesthesia: Novocain Solution (local infiltration).

An oblique incision was made over the 3rd, 4th, and 5th costochondral junctions with a convexity to the left. The cartilages with the costal muscles were reflected medially. It was necessary to fracture the cartilages at the chondrosternal junction before this could be accomplished. Several adhesions between the lung and the anterior chest wall were ligated. A small amount of blood was evacuated from the lower portion of the left chest. A small stab wound entering the upper and left portion of the pericardial cavity was enlarged and about 100-150 cc. of blood evacuated from the pericardium. A large intercostal artery was found to be severed and bleeding through the lung and pleura into the pericardium. There was also a stab wound in the heart just below the left auricle which was incomplete in that it did not extend through the endocardium. The pericardium was tightly distended with blood which had compressed the heart. When an opening was made into the pericardium there was an immediate escape of blood. The heart rate, which had been rapid and of poor quality, immediately became slower and took on long, powerful contractions. His pulse was immediately felt at the wrist. As the heart muscle was not bleeding it was felt that only one stitch was necessary. One large rubber tissue tubular drain was placed in the pericardium and the wound sutured around this with plain catgut No. 1. Two rubber tissue tubular drains were placed in the pleural cavity and brought out through the lower end of the incision. The wound was then closed with chromic catgut No. 2, re-approximating the cartilages to their normal positions. Several silkworm gut sutures were taken through the skin and the skin closed with Michel clips. Patient was given 450 cc. of citrated blood and 1000 cc. of 5% glucose in normal saline intravenously during the operation.

Electrocardiogram taken immediately after operation showed very little change from that taken before operation.

FINAL DIAGNOSIS:

(1) Stab wound, left chest, 4th interspace, passing through lung, pleura and pericardium.
(2) Stab wound of heart, left ventricle, incomplete.
(3) Cardiac tamponade from intrapericardial hemorrhage.
(4) Possible pneumopericardium with pneumothorax.

PROGRESS NOTES DURING STAY IN HOSPITAL:

There was a large amount of drainage during the first 24 hours. His temperature ranged from 102 to 103.8. The drainage was of a serosanguineous nature. Respiration ranged between 30 and 36 per minute. Patient was given two 1000 cc. glucose infusions daily for six days. The pericardial drain was removed in twenty-four hours and was followed by the seepage of 200-300 cc. of serosanguineous material. Temperature remained around 102-103 for

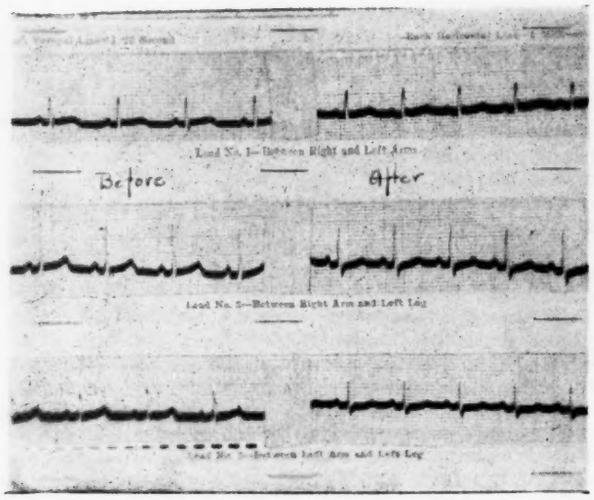

Fig. 1—Electrocardiograms before and after operation.

eight days. Drainage gradually decreased. The pleural drain was removed after six days. Respiration gradually slowed down to around 26 per minute. Pulse retained its good volume from the time of operation and remained between 130 and 140 per minute for ten days. On April 27th 600 cc. of citrated blood was given intravenously without a reaction. On April 30th his temperature was 103 F., respiration 32. There was dullness over the left chest. The chest was aspirated but only 200 ccc. of seropurulent material was removed. Following this there was an increase of discharge from the drainage wound and an open pneumothorax developed. A large amount of fluid of the same nature came out of this opening for the next ten to twelve days. Cultures from this fluid showed many staphylococcus aureus and streptococcus hemolyticus. The discharge gradually became thick, yellowish pus. As soon as the open pneumothorax developed, one-fourth of an ounce of fresh azochloramide solution in olive oil was placed in the open cavity every four hours with a small syringe. This apparently hastened convalescence considerably, because of the marked diminution in the amount of discharge. There were several abscesses around the stitches which were removed on the 12th day. Examination of the chest showed a rapid re-expansion of the left lung but rather distant breath sounds with some dullness persisting at the base. Condition on discharge improved.

FOLLOW-UP NOTES:

May 25, 1938: Patient seen at home. Pulse and respiration normal. Complains of tight feeling in chest occasionally. Appetite good. Small amount of drainage from wound. Dressing changed.

May 30, 1938: Decrease in amount of drainage. Patient still in bed most of the day.

June 7, 1938: Blood pressure 170/90. Weight 146 pounds. X-ray of the chest showed some haziness of the lower portion of the left chest, apparently due to a thickened pleura in this region. Physical examination still showed distant breath sounds in this area. No murmurs were heard. Heart sounds were rather distant. Kahn test was taken at this time and reported as four plus. 0.6 grams Neoarsphenamine was given intravenously. Electrocardiogram at this time showed definite, apparently temporary, myocardial changes suggesting

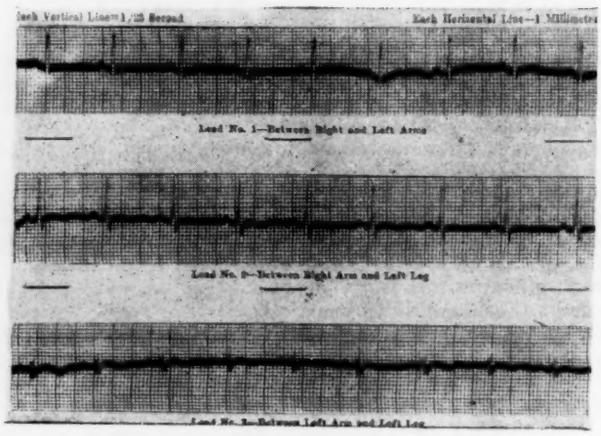

Fig. 2—Electrocardiogram 6 weeks after operation.

marked reduction of myocardial tone from previous record.

June 14, 1938: Dressing changed. Small amount of discharge. Slight deformity of costal cartilages which were very firm. They apparently had healed well. 0.6 gram of Neoarsphenamine was given intravenously.

July 1, 1938: Dressing changed. Drainage ceased. Patient to do light work. 0.6 gram Neoarsphenamine given intravenously.

Oct. 28, 1939: Has been receiving antiluetic therapy regularly. Chest firm. No discomfort. Apparently cured.

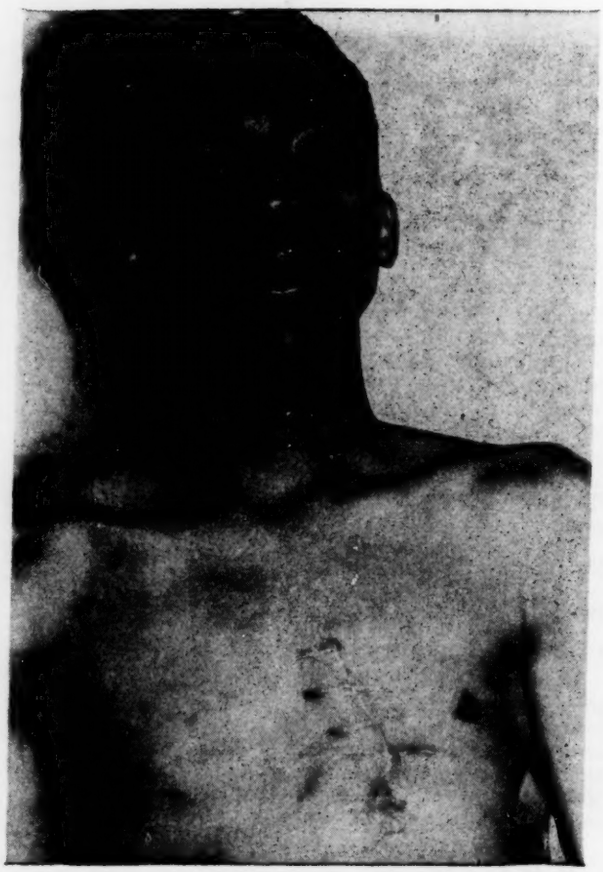

Fig. 3—Scar of operation.

STAPHYLOCOCCUS MENINGITIS

Report of a Case With Cure

ROBERT L. McMILLAN, M.D.

WINSTON-SALEM

From the available details at hand, both in the current literature and in various textbooks, the outstanding feature of staphylococcus meningitis is that the disease is almost uniformly fatal regardless of origin, duration, patient's age, sex, or the treatment instituted. Only eleven cases have been reported as treated and cured up to 1939.

The following case is presented not with the idea of demonstrating a medical rarity, but rather to bring forward as a suggestion for further use in diseases of this type, staphylococcus antitoxin by the three main parenteral routes, subarachnoid irrigation, and blood transfusions.

The effectiveness of staphylococcus antitoxin is greatly enhanced by the use of sulfanilamide and likely will be more so by sulfapyridine, since the latter has been shown to have a very definite bacteriostatic action on staphylococci. Also, it has been clearly demonstrated in cases of staphylococcic bacteremia that blood transfusions greatly increase the effectiveness of the antitoxin, and should be liberally employed.

REPORT OF CASE

P. J. V., a seven year old school girl, was admitted to the North Carolina Baptist Hospital May 10, 1938, having been referred by Drs. Belmont and Rupert Helsabeck of King, North Carolina.

CHIEF COMPLAINT: Pain in the abdomen for two weeks.

FAMILY HISTORY: Irrelevant.

PAST HISTORY: Normal birth and development. Usual childhood diseases. Generally exceptionally healthy and robust. No operations or injuries.

PRESENT ILLNESS: About two weeks before admission the patient complained of occasional generalized abdominal pains. She continued at school, but ate poorly and did not play as actively as common. One week before admission the pains became considerably worse and there was nausea and vomiting. At this time her temperature was 101 F. (38.6 C), and there was slight stiffness of the neck, which was thought to be meningismus. General physical examination was normal except for the above, and slight generalized abdominal tenderness. Within a day or two the temperature became normal and the child returned to school. Three days before admission all of the above symptoms became decidedly worse and the temperature was found to be 103.8 F. (40 C). There was no headache or earache and the ears, nose, and throat were normal except for slightly enlarged tonsils.

PHYSICAL EXAMINATION: T. 103.8 F. (40 C), P. 96, R. 20, B.P. 100 mm. mercury systolic; 60 mm. diastolic. The patient was obviously gravely ill, lying on her side in opisthotonic position, her eyes shielded from the light, delirious and slightly cyanotic. The neck was quite stiff. There was slight generalized lymphadenopathy and exquisite tenderness over the lumbar spine. The tonsils were enlarged and infected. Heart and lungs were normal. There was slight generalized abdominal tenderness, but no masses or localized tenderness. Carnial nerves were normal except for choking of the optic discs to two diopters. The tendon reflexes were over-active but equal. Kernig's sign was present right and left grade IV.

ACCESSORY CLINICAL DATA: Leucocytes 38,250, Polymorphonuclear 96%, mainly adult forms, Lymphocytes 4%, Red Blood Cells 4,070,000, Hgb. 61% or 15.5 gms. (Sahli). Spinal fluid 60% solidly purulent material. The first cell count possible was 65,000—P.M.N. 99%. L. 1%.

IMPRESSION: Meningitis of some type. Due to marked tenderness over the lumbar spine and signs of meningitis along with abdominal pains, Pott's disease was considered; but the x-ray was negative. Spinal puncture reavealed thick, tenacious, purulent fluid. Smear showed Gram positive cocci. Culture showed pure growth staphylococcus aureus. The patient rapidly lapsed into unconsciousness.

TREATMENT: Realizing from past experience the futility of treating cases of staphylococcus meningitis it was decided to use certain precedures, which, in the average case of meningitis, have always been thought radical and injudicious. With the idea in mind of providing adequate drainage, frequent spinal punctures were done. For the first four or five days it was necessary to irrigate the subarachnoid space with a warm solution of normal saline, because of the fact that the spinal fluid was too thick to drain through a large spinal puncture needle. This irrigation was accomplished by gently washing in and out by means of a 20 cc. syringe. The sixth hospital day a number 8 ureteral catheter was introduced through a canula into the lumbar subarachnoid space. The canula was then withdrawn, leaving the ureteral catheter in place to provide constant drainage. At this stage the fluid was too thick to drain and the catheter was hopelessly plugged up after eight hours. Frequent spinal punctures with irrigation were subsequently employed. In spite of normal otoscopic findings by several examiners it was decided to perform bilateral myringotomy. On the fifth hospital day the left eardrum was incised and a large amount of pus was obtained containing organisms identical with the spinal fluid cultures. Prontosil was given in large amounts intramuscularly through the first four hospital days, and after this 40 grains of sulfanilamide daily was given by mouth for one week. Seven blood transfusions of 200 to 300 cc. citrated blood were given. Also staphylococcus antitoxin (Lederle) was given as follows: intrathecally, 60,000 units; intravenously, 100,000 units; and intramuscularly, 45,000 units, in divided doses.

The thickly purulent spinal fluid soon became thin enough to drain through a large needle and, with the use of antitoxin intrathecally, cultures became negative in two weeks. The antitoxin was also washed back and forth in the subarachnoid space following saline irrigation, and the patient was placed in Trendelenberg's position for twelve hours after the antitoxin was introduced.

The child's recovery was remarkably rapid. She was able to take food, fluids, and medication by mouth after the fourth hospital day. She was discharged from the hospital June 7, 1938. The only residuum was mental confusion which was extreme, but which seemed to improve gradually, until one month after discharge she was apparently normal and, in fact, exceptionally bright. Upon her return home she developed successively pyelitis, severe tonsilitis, and broncho-pneumonia, from each of which she made a good recovery. She remembers not one detail of her hospital experience.

This patient must be accepted as a case of staphylococcus meningitis completely cured, since she has no demonstrable sequelae, has made one and one-half years in school with honors, and was presented personally to the regular October meeting of the North Carolina Baptist Hospital in obvious robust good health, eighteen months after her illness.

...THE BULLETIN BOARD...

PRESIDENT'S LETTER

With the launching of the State Society's official Journal, I wish both the editor and the Journal a happy voyage. The interest and cooperation of our members in the venture seem assured. The importance of medical journalism in modern medical practice is too evident to need elaboration. In school we studied books, in practice we study journals; the better the journals, the better practitioners we are. Whenever we become too busy to report our own experience or too lazy to learn from the experiences of our fellow workers, then we deserve nothing better than the mediocrity which will inevitably overtake us.

WILLIAM ALLAN.

SECRETARY'S MESSAGE

Our Society has lived well within its budget for 1939. All obligations for the year have been met, leaving the most comfortable balance in our history.

Likewise our membership has reached its highest peak. However, there are still over four hundred physicians in North Carolina who are not members of organized medicine. We feel that the Society needs them within its fold and that, with the cloud of socialized medicine above the horizon, our ranks present the only protection to medicine today. To those who are not now members of our State Medical Society we extend a cordial invitation.

T. W. M. LONG.

CAROLINA'S NEW MEDICAL LABORATORY AND PUBLIC HEALTH BUILDING

On December 4 the new Medical Laboratory and Public Health Building at the University of North Carolina in Chapel Hill was formally dedicated. The new building, of Georgian architecture and representing a total outlay of approximately $450,000, was made possible by a legislative appropriation and a PWA grant. There are five full floors and a sub-basement which house the Division of Public Health and the Departments of Pathology, Bacteriology, Pharmacology, Physiology, Anatomy, and Biological Chemistry. In addition there are an auditorium with a seating capacity of approximately 200, a beautifully designed medical library, and modernly equipped animal quarters.

In connection with the new Medical Building there is a dormitory nearby which houses the majority of the medical and public health students. As a part of the original legislative and PWA grant, a new wing has been added to the University Infirmary for the development of a small medical dispensary in connection with the teaching of physical diagnosis in the Medical School.

At the morning exercises on December 4, presided over by Dean R. B. House of the University, greetings were brought to the school from President F. P. Graham; Dr. I. H. Manning, Emeritus Professor of Physiology, and for many years Dean of the Medical School; Dr. William Allan, President of the State Society; Dr. Carl V. Reynolds, of the State Health Department; Dr. C. C. Carpenter, Dean of the Wake Forest Medical School; and Dr. W. C. Davison, Dean of the Duke Medical School. The main address of the morning was made by Dr. E. K. Marshall, Professor of Pharmacology at the Johns Hopkins School of Medicine, on the subject, "Medical Research—The Story of Sulfanilamide."

At the afternoon session Dr. David Riesman. Professor Emeritus of Clinical Medicine and Professor of the History of Medicine at the University of Pennsylvania School of Medicine spoke on "The Making of a Clinician." Dr. G. Canby Robinson. Lecturer in Medicine and Director of the Medical Clnnic at Johns Hopkins, spoke on "The Application of Medical Science to the Individual."

Approximately 250 alumni and friends of the Medical School attended a banquet at the Carolina Inn in the evening, at which Dr. William Coppridge of Durham was toastmaster. The principal address was made by Dr. Boudreau, Executive Director of the Milbank Memorial Foundation, on, "New Health Frontiers." In addition, short talks were made by Mr. Victor S. Bryant of Durham for the Trustees' Building Committee; Mr. Stanley H. Wright of the PWA; Dr. John C. Tayloe of Washington, President of the Medical Alumni Association; Dr. J. K. Hall of Richmond, representing the Whitehead era of the school; and Dr. W. deB. MacNider.

NEWS NOTES FROM DUKE UNIVERSITY SCHOOL OF MEDICINE

On October 14, Dr. Marvin A. Stevens, of the Yale University School of Medicine, held a clinic on athletic injuries.

From October 19-21 the Annual Post-Graduate Symposium on Diseases of the Lungs and Thorax was held, in which the following participated: Dr. Edward D. Churchill, Dr. Frederick T. Lord and Dr. Maxwell Finland, of the Harvard Medical School; Dr. Daniel M. Brumfiel, of Trudeau Tuberculosis School, Saranac Lake, N. Y.; Dr. Chester A. Stewart, of the University of Minnesota School of Medicine; Dr. Edward N. Packard, of the New York State Hospital for Incipient Tuberculosis, Ray Brook, N. Y.; Dr. Cameron Haight, of the University of Michigan; Dr. William DeW. Andrus, of Cornell University; Dr. Isaac A. Bigger of the Medical College of Virginia; Dr. Charles R. Austrian and Dr. William F. Rienhoff, of The John Hopkins University School of Medicine;; Dr. Dickinson W. Richards Jr., of Columbia University College of Physicians and Surgeons; ;Dr. Stuart W. Harrington. of Mayo Clinic; Dr. Daniel C. Elkin, of Emory University School of Medicine and Dr. Gabriel Tucker, of the University of Pennsylvania School of Medicine.

On October 21 the Baltimore-Washington Dermatological Society met at Duke Hospital.

On October 25 Dr. William Allan, President of the North Carolina Medical Society gave an illustrated lecture on Heredity and Disease.

On November 14 Dr. Harvey B. Stone, Associate Professor of Surgery of The Johns Hopkins University School of Medicine, held a surgical clinic.

On December 16 Mr. Charles C. Thomas, Publisher, of Springfield, Ill., and Baltimore, Md., held a clinic for the staff and students on Medical Publications.

On the above date the autumn quarter ended, with eighteen seniors completing the medical course, all of whom have obtained internships commencing January 1, 1940.

The Bowman Gray School of Medicine of Wake Forest College

Announcement of the expansion of the present Wake Forest Medical School to offer the complete four year course, granting the M.D. degree, was made on August 6, 1939. This was made possible by funds received through the Bowman Gray Foundation and by the hospital facilities of Winston-Salem, plus the present resources of the two-year school. On November 22, 1939, the trustees of the college voted to give it the name of The Bowman Gray School of Medicine of Wake Forest College, when it moves to Winston-Salem.

Northup and O'Brien of Winston-Salem have been selected as architects, and plans are rapidly being developed for the construction of the medical school building and the additions to the Baptist Hospital. Construction will begin in early spring, and it is hoped that it will be completed by the opening of school in September, 1941. Whether clinical instruction will be added by that time will depend on how rapidly the hopitals can be placed professionally on a teaching basis.

The policy of the school will be to offer the most modern type of instruction to a selected number of students of ability and character. The classes will be limited to fifty each. A special effort will be made to provide an opportunity for a medical education to students from the rural districts of North Carolina, using every encouragement to induce them to go back to their home community for the practice of medicine.

Medical Society of South Carolina Sesqui-Centennial

On December 5, 1939, the Medical Society of South Carolina celebrated the sesqui-centennial anniversary of its founding. The celebration was held in Charleston, where the Society was founded in 1798 by a group of physicians under the leadership of Drs. Peter Fayssoux, Alexander Baron, and David Ramsay. It was the first permanent medical organization in Charleston, and for a long time was the only medical organization in South Carolina. Under its auspices were established a Medical College—now the Medical College of the State of South Carolina—and two medical journals, the "Carolina Journal" and the "Southern Medical and Surgical Journal". Other projects sponsored by the Society included a Botanical Garden, the purchase of an apparatus for the resuscitation of drowned persons, and the recording of weather observations. In 1848 a convention called by the Society formed the South Carolina Medical Association, of which the Medical Society of South Carolina became a constituent member. Dr. James Moultrie was the first president of the new organization, and was later elected President of the American Medical Association.

The program for the sesqui-centennial celebration began with a reception at the Gibbes Art Gallery, where an exhibit of paintings, books, and other material related to the early history of the Medical Society of South Carolina was opened. This was followed by a banquet at the Francis Marion Hotel. Addresses of welcome were given by the Hon. Henry W. Lockwood, Mayor of Charleston, and the Hon. Burnet R. Maybank, Governor of South Carolina. A Tablet from the South Carolina Medical Association was presented to the Society by Dr. William Weston, and Dr. Douglas Jennings, president of the Association, brought greetings. "An Historical Sketch of the Medical Society of South Carolina" was given by the president, Dr. James J. Ravenel. Dr. Nathan B. Van Etten, President-Elect of the American Medical Association, spoke on "An American Health Program"; and Dr. Francis R. Packard, Editor of the ANNALS OF MEDICAL HISTORY, spoke on "Scientific Links between Charleston and Philadelphia in the Eighteenth Century".

North Carolina Pathological Society

The North Carolina Pathological Society held its annual meeting at the City Memorial Hospital in Winston-Salem on December 12 at 2:30 p. m. The program included papers on: "Possible Relation Between Hodgkin's Disease and Brucellosis", by Dr. Wiley D. Forbes, Professor of Pathology, Duke University; "The Effect of Renal Injury upon the Regeneration of Plasma Proteins", by Dr. Russel D. Holman, Associate Professor of Pathology, University of North Carolina; "Illustrative Cases of Unusual Positions of Malignancies", by Dr. L. C. Todd, of Charlotte; "Case Reports", by Dr. T. T. Frost, Pathologist to the City Memorial Hospital, Winston-Salem.

Officers elected for the year 1940 were: President, Dr. L. C. Todd, of Charlotte; vice-president, Dr. W. M. Summerville, of Charlotte; secretary, Dr. C. C. Carpenter, of Wake Forest.

Forsyth County Medical Society

The annual business meeting of the Forsyth County Medical Society was held as a dinner meeting at the Robert E. Lee Hotel Winston-Salem, on December 12, at 6:30 p. m. Dr. Kenneth Lynch, Professor of Pathology at the Medical College of South Carolina, spoke on "Pancreatitis," The following officers were elected for the year 1940: Dr. B. B. Pool president, succeeding Dr. Beverly N. Jones; Dr. V. F. Couch, first vice president; Dr. Fred Garvey, second vice president; Dr. P. A. Yoder, secretary; Dr. Robert McMillan, treasurer; Dr. J. P. Rousseau, member board of censors; Dr. B. N. Jones and Dr. V. M. Long, delegates to the state medical society, with Dr. P. A. Yoder, Dr. S. D. Craig, Dr. V. C. Lassiter, and Dr. S. W. Rankin as alternates.

Buncombe County Medical Society

The Buncombe County Medical Society held two meetings in December. On December 4, at 8:00 p. m., the society met at the City Hall in Asheville. A paper, "Urgent Surgery on Infants", was read by Dr. F. Webb Griffith, and a case report, "Primary Bronchogenic Carcinoma", by Drs. Margery Lord and Donald MacRae, was given. On December 18, at 6:30 p. m., the society held its annual meeting and banquet at Grove Park Inn.

Caldwell County Medical Society

The Caldwell County Medical Society at its regular meeting on December 19, was entertained by Dr. Verne H. Blackwelder at his residence on South Mulberry Street, with a delicious turkey dinner and all the trimmings.

A full attendance was recorded and an enjoyable evening was had by all.

The following officers were elected for 1940:

President, A. A. Kent, Jr., Granite Falls, N. C.; vice-president, L. M. Fetner, Lenoir, N. C.; secretary and treasurer, Douglas Hamer, Lenoir, N. C.; delegate to state medical society, C. R. Hedrick, Lenoir, N. C.; alternate G. R. Russell, Granite Fall, N. C.

Warning to Oculists

A letter has come from Dr. Herbert C. Kimberlin of Trenton, Missouri, requesting that we publish a warning to the oculists of North Carolina about a crook who has been operating in Missouri and North Carolina. His practice is to pose as a farmer desiring to have glasses fitted, and to pass a check for $30.00—usually with a notation for chicken or livestock—asking for change. He does not call for the glasses. The signature and endorsement are forged. He has used the names W. C. Curran, J. B. Powers, W. C. Cursey, and others. Dr. Kimberlin describes him as being about five feet nine or ten inches tall, about 155 pounds, with light sandy hair, blue eyes, and a smooth shaven, ruddy complexion. He is also described as having a sandy complexion and reddish-brown hair, and weighing about 170 pounds. He gives his age as 43 to 49. One oculist who examined his eyes reported the following findings: Pupils small; distant vision, right and left, 20/16 minus with a correction of only one quarter diopter astigmatism; axis 86 in right; in left the same amount of astigmatism, axis 80. Pupilary distance. 64 mm.; temple, 4½; length, 6¼; bridge height, 2/16; bridge forward, 1/12.

This man has operated in Missouri for a number of years, and, in October, 1939, appeared in Gastonia. N. C. Oculists are asked to be on the look out for him, and, should they be given a check by such a person. to notify the Sheriff of Nodaway County, Maryville, Missouri, or the Sheriff of Grundy County, Trenton, Missouri, or Dr. Herbert C. Kimberlin, Trenton, Missouri.

The Professional Man's Not a "Clock-Watcher."—He does not count on regular hours. He realizes when he takes up the study of medicine that his sleep will often be interrupted. that his time will not really be his own, and he rejoices to feel that he may be called upon when others are in need regardless of his own comfort. One other point of distinction may be mentioned, and that is the principle as laid down in the Hippocratic oath that he will teach this art to others if they wish to learn it "without fee or stipulation." The physician, and indeed any professional man, should emulate the Clerk of Canterbury Tales of whom Chaucer said: "And gladly would he learn and gladly teach." Winfred Overholser: The Broadening Horizons of Medicine, **Science**, 90:2338 (Oct. 20) 1939.

WOMAN'S AUXILIARY

Officers

President: Mrs. C. F. Strosnider, Goldsboro.
President-Elect: Mrs. C. R. Hedrick, Lenoir.
First Vice President (Organization): Mrs. Joseph A. Elliott, Charlotte.
Second Vice President (McCain Bed): Mrs. Alfred A. Kent, Jr., Granite Falls.
Third Vice President (Loan Fund): Mrs. R. A. Moore, Winston-Salem.
Chairman of Past Presidents: Mrs. P. P. McCain, Sanatorium.
Corresponding Secretary: Mrs. Jack Harrell, Goldsboro.
Treasurer: Mrs. C. E. Judd, Raleigh.
Recording Secretary: Mrs. J. D. Freeman, Wilmington.
Chairmen of Standing Committees:
- Mrs. Frederick R. Taylor, High Point, Program.
- Mrs. R. S. McGeachy, New Bern, Research.
- Mrs. Isaac Manning, Chapel Hill, Memorial.
- Mrs. William Earl Overcash, Southern Pines, Hygeia.
- Mrs. Sidney Smith, Raleigh, Press and Publicity.
- Mrs. James Buren Sidbury, Wilmington, Public Relations.
- Mrs. C. E. Howard, Goldsboro, Scrap Book.
- Mrs. G. Erick Bell, Wilson, Historian.
- Mrs. C. D. Thomas, Sanatorium, Exhibits.
- Mrs. Hamilton W. McKay, Charlotte, Legislature.
- Mrs. Thomas Leslie Lee, Kinston, Jane Todd Crawford Memorial.

Councillors:
- First District: Mrs. H. D. Walker, Elizabeth City.
- Second District: Mrs. John C. Tayloe, Washington.
- Third District: Mrs. J. S. Brewer, Roseboro.
- Fourth District: Mrs. M. A. Pittman, Wilson.
- Fifth District: Mrs. W. T. Rainey, Fayetteville.
- Sixth District: Mrs. Ben Lawrence, Raleigh.
- Seventh District: Mrs. Harry Winkler, Charlotte.
- Eighth District: Mrs. Wm. P. Knight, Greensboro.
- Ninth District: Mrs. J. W. Vernon, Morganton.
- Tenth District: Mrs. W. C. Johnson, Canton.

Advisory Board:
Dr. Hubert Haywood, Raleigh; Dr. S. D. Craig, Winston-Salem; Dr. W. H. Cobb, Goldsboro.

A MESSAGE TO THE MEMBERSHIP OF THE AUXILIARY FROM ITS PRESIDENT

In thinking out my plans and policies for the Auxiliary to the Medical Society of the State of North Carolina for 1939 and 1940, I realize that I am intrusted with the responsibility of carrying forward the same ideals and high purposes that were born into the organization 16 years ago when it came into being April 18, 1923, in Asheville with Mrs. P. P. McCain as president. It is my sincere desire to be guided by these same principles during my administration, interpreting them in the light of modern needs.

What we accomplish this year depends upon the energy and enthusiasm of the local auxiliaries, and what you do as an individual. The slogan for the state officers is: "Know your Job and Take Pride in Doing It." The state officers are well informed on their duties, are unselfish, faithful workers, and stand ready to help any auxiliary or auxiliary member that calls upon them. And may I urge the auxiliaries to ask them for help whenever aid is needed. I call on each of you to help earnestly to make 1939 and 1940 a most successful year! From time to time, I shall ask you to do specific things, but I am counting on you individually and collectively to support our philanthropies, to increase our membership, and to be informed.

In fact, my motto for the year is "Be Informed and Inform Others". By this I mean:

Know the objectives of our auxiliary—they give us noble ends to attain.

Know the history of our organization, which gives us pride in its splendid accomplishments and inspiration for future work.

Know the health laws passed by the 1939 legislature and what is your part in seeing that they are enforced.

Know how to discuss socialized medicine intelligently in informal groups.

Know why the Wagner Bill or its substitute if made into law, will not be for the best interest of the doctor or the public.

These last three suggestions give us an opportunity to perform a much needed service.

Realizing that the Auxiliary to the Medical Society of the State of North Carolina has a big work to do, I am most anxious to increase our membership greatly this year; the bigger the membership, the bigger the job we can do. Last year Mrs. Elliott had for her slogan "Every Doctor's Wife a member of Either County or District Auxiliary". This is a good slogan, so I am keeping it this year, hoping it will be fulfilled; for I would like to say personally to each doctor's wife, "The Auxiliary needs you and you need the Auxiliary". If every doctor's wife knew the aims and ideals of the Auxiliary; if she knew the need for the work the Auxiliary is doing; if she knew the worthy people without means that are nursed back to health on the McCain Bed, or the doctor's children who have been aided at college by the Student Loan Fund; if she knew the necessity for being properly informed on socialized medicine, health bills, etc.; if she knew the satisfactory friendships that are formed in auxiliary work, and the good times that are enjoyed at the local and state auxiliary meetings; if she knew how her dollar was needed and spent, I believe every doctor's wife would want to become an auxiliary member. My plea is to spread this information and double the 1939 membership, which was 435. Remember that the organization started with a membership of 53 in 1923. I so hope every eligible doctor's wife will come into the fold before March 15, 1940.

To stimulate interest in securing a full membership this year I am offering a prize of $5.00 to be awarded to the district obtaining the greatest number of dues, on a percentage basis, by May 1, 1940. The district which receives the $5.00 will in turn present it to the McCain Endowment Fund. Will you help your district win this honor?

As you know, we have two philanthropies which the Auxiliary sponsors, and which are doing a very worthwhile work. The first of these, the McCain Bed, was started in 1929 when Mrs. R. S. McGeachy was president. The occupants of this bed are doctors, their children, nurses, and other worthy persons without funds, who are ill with tuberculosis. Our purpose is to restore them to health and usefulness. Ten patients have used this bed since it came into being. Funds for carrying on this good work come from 50 cents of the dollar dues paid into the Auxiliary. May I state here that of the other 50 cents of the dues, 25 cents goes to State Headquarters for expenses, and 25 cents to the National Headquarters. To be sure of this expense money for the McCain Bed, and to make the bed a permanent project easily financed, the Auxiliary, in 1935, started an endowment fund of $10,000. In May, 1938, a little over $1,000 of this money had been raised. Please help toward this goal by securing as many subscriptions to *Hygeia* as you can and sending them to Mrs. K. B. Pace, State *Hygeia* Chairman, Greenville, N. C. The profit that the Auxiliary gets from these subscriptions is turned over to the McCain Bed Endowment Fund. And in this fund you have a chance to win another honor. Mrs. Kent, State Chairman of the McCain Bed, is offering a $5.00 prize to the district

raising the largest amount of money for this purpose. You will hear personally from Mrs. Kent in January.

I also hope you will be most interested in raising money for the Student Loan Fund. Mrs. R. A. Moore, Chairman of the Student Loan Fund, is offering a prize of $5.00 for the district making the largest contribution to this fund. This goal is also $10,000. The money, as you remember, is used to make loans to doctors' children in their junior and senior years at college. Since its organization in 1930, six loans have been made. Mrs. Moore has already mailed out a most instructive and appealing letter for this cause.

My message to you about what has been done this year is very encouraging. We started off with a most interesting board meeting with Mrs. McCain on October 12, 1939. Mrs. McCain entertained in her usual charming and informal manner. The happenings were interesting and vital to the life of our organization. I shall not take the space to tell you about the business taken up, but please read about it in the minutes which will be printed later on in the journal. I am very happy to tell you that under Mrs. R. S. McGeachy's leadership and at a lovely luncheon she gave in New Bern, a new auxiliary of 13 members was formed on November 2, 1939, with Mrs. McGeachy as president and Mrs. Barker as secretary. On December 13, I attended a joint meeting of the Medical Society and Auxiliary in Clinton, in Mrs. Brewer's district. It was a most friendly and interesting meeting—a dinner meeting with the doctors and an Auxiliary business meeting in the home of Mrs. J. S. Ayers afterwards. They are now engaged in getting subscriptions for *Hygeia*, and have their plans all made for a money-making project for the McCain Bed in January. I am sure that there are many other interesting things happening over the state, but I haven't, as yet, had a full report from them.

As a final request, may I ask you to get a copy of *Industrial Medicine and Surgery* for the month of October, 1939, and read the article on "Socialized Medicine" (page 423) by Dr. Webb Griffith of Asheville. This is an excellent article on the subject and will certainly familiarize everyone with the Wagner Bill.

I am sure that you, as an auxiliary, are as grateful to the Medical Society for this space in their MEDICAL JOURNAL as I am, and I hope you will form the habit of reading our material from month to month. I expect to have articles that will be pertinent to our organization, concerning its history, the work we are doing, plans for future work, and special articles concerning the McCain Bed, Student Loan Fund, duties and work of special committees, etc. I also hope we can give part of this space to items of interest from different auxiliaries.

(Signed) ANNA L. STROSNIDER
President of the Auxiliary to
the Medical Society of the
State of North Carolina.

In Memoriam

RESOLUTIONS OF RESPECT ON THE DEATH OF DR. L. B. McBRAYER*

We, your committee appointed at the Louisville meeting to formulate resolutions of respect on the death of Dr. L. B. McBrayer, desire to submit the following—

That whereas, an All-wise Providence has seen fit to call our beloved leader and fellow-crusader, Dr. Louis Burgin McBrayer, to his eternal rest on April 1, 1938,

And, whereas, those of us who are left behind realize fully the enormous loss sustained in his passing by his family, his friends, the North Carolina medical profession, the North Carolina Tuberculosis Association, and the National Tuberculosis Association, as well by the almost limitless other organizations and individuals with whom he was associated and with whom he labored long and so successfully,

Be it therefore resolved: that we give most sincere thanks to our Heavenly Father for this long and useful life which was spent by our friend among us; for his outstanding career of leadership in so many fields; for his innumerable qualities of the highest type of ability in such a wide-spread area of service to humanity; and above all, for his matchless knack of being able with his leadership to inspire and stimulate his followers and students to efforts which otherwise they would never have been able to make.

And be it further resolved: that a copy of these resolutions be inscribed in the minutes of this Conference, and that copies be furnished the family of Dr. McBrayer, the North Carolina and the National Tuberculosis Association, and to the press.

Respectfully submitted,
(Signed) Paul A. Yoder, Chm.
Paul H. Ringer,
Arthur T. McCormick.

*Adopted by unanimous vote at the annual meeting of the Southern Tuberculosis Conference at Charleston, S. C., October 6, 1939.

DR. HENRY BASCOMBE WEAVER

Our Buncombe County Medical Society grieves over the loss on February 13, 1938, of its oldest member, Dr. Henry Bascombe Weaver. Tempered, it is true, by the full measure of his years and his honors, our grief is none the less a real sorrowing; it carries a sense of finality in that his passing breaks the last link that connected us with a past already remote.

As in his life were united eighty-six years of time that completely bridged an intervening and universally recognized era, so in his personality and in his practice Dr. Weaver blended the social habits and the trends of professional thought of three eras. In a word, he was always abreast of the times.

He was born into a family of peculiar longevity, of prominence and wide connections, born into a world of pioneering, of horse-back trails and felling forests. At an early age he got the best education, both secular and professional that the times afforded. In the seventies and eighties of the last century he carried his heritage of culture and his professional skill into every corner of the near-wilderness that is now Yancey, Mitchell and Avery Counties. In the early nineties he came to the rising city of Asheville, where for nearly fifty years he dispersed with unobtrusive gentleness and wisdom that undescribable commodity we know as General Medicine. In the nineties he was a member of the young State Board of Medical Examiners which he had helped to bring into being.

He was a reader and a student, and gifted with an active mind that kept him in touch with progress to the end. An admirable trait was the freedom with which he drew upon opinions and skill he considered more expert than his own by consultation.

This sketch would not be complete without a word as to his loyalty to the land that bore him. Second only to the love of his profession was his love of his farm and the music of his hounds.

To the end that his long life of loyalty and service may be an inspiration and a challenge to younger generations, we move, Mr. President, that a page of our minutes be devoted to this tribute to his memory.

(Signed) G. S. Tennent, Chairman
Chas. Hartwell Cocke
Charles C. Orr.

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DR. JOHN D. KERR

Dr. John D. Kerr, Jr., a native and life-long resident of Sampson County, N. C., died in James Walker Memorial Hospital, Wilmington, N. C., on March 14, 1938. Death was the result of injuries received in an automobile accident.

Doctor Kerr was born on the old Kerr plantation on Black River in the lower part of Sampson County in 1884. He was the son of John D. Kerr and Susan Hubbard Kerr. In 1893 the family moved from the plantation to Clinton, where the father engaged in the practice of law until his death in 1923.

Doctor Kerr attended public school in Clinton, and the Wright Academy near the forks of Coharie in lower Sampson. Later he attended the University of North Carolina, and then the University of Maryland. From the latter he was graduated as a Doctor of Medicine in 1908.

After serving an internship in a hospital at Rocky Mount, N. C., Doctor Kerr returned to Clinton and started in general practice. In 1910 he married Miss Lovie Pickford, also of Clinton, and to this union were born six children—three boys and three girls.

In April, 1917, Doctor Kerr entered the military service as a first lieutenant in the Medical Corps of the United States Army. He served at Camp Sevier, South Carolina, and later with the Thirteenth Division in France. After the close of the war he returned to this country, and was discharged with the rank of captain. He again took up the practice of medicine in Clinton, but retained his interest in military affairs. In 1923 he was appointed assistant surgeon of the 106th Medical Regiment, North Carolina National Guard, with the rank of lieutenant-colonel. This position he held until the time of his death.

Doctor Kerr was a member of the State Medical Society, the Independent Order of Odd Fellows, the American Legion, and the Presbyterian Church. He was given military rites of burial, the funeral being held from the home on March 17, 1938.

In the passing of Doctor Kerr the state of North Carolina lost one of its most valued and best-beloved men of medicine. As a doctor he was idolized by his patients and held in the highest respect by his colleagues.

(Signed) V. R. Small
O. L. Parker,
Committee,
Sampson County
Medical Society.

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At a meeting of the Guilford County Medical Society held June, 1939, the following tribute, offered by Dr. Brockton R. Lyon, was unanimously adopted:

WASHINGTON JEHU MEADOWS, M.D.

It is with profound sorrow that we are called upon to record the death of Dr. Washington Jehu Meadows, a member of this society for many years, which occurred at St. Leo's Hospital on April 21, 1939, from a cerebral hemorrhage.

Dr. Meadows was widely known, and expressions of highest praise for the man and deepest grief on account of his death have been universal.

But mortal memory is a shadow which quickly fades. Therefore, that those who come after may know something of the details of his career, and the esteem in which we as brother members of his profession held him, it is our desire that an enduring record be presented in the archives of this society.

Dr. Washington Jehu Meadows, son of Warner William and Mary Hubbard Meadows, was born in Chambers County near Lafayette, Alabama, on the 29th day of December, 1871. His early education was obtained in the Chambers County Schools, followed by his graduation from Lafayette College in 1891. He then attended Alabama Medical College at Mobile and was graduated with the degree of Doctor of Medicine in 1894. For several years he practiced in Longdale, Alabama, which was followed by a year of post-graduate study in New York City. Dr. Meadows then moved to Greensboro in the spring of 1898, and continued the active practice of medicine until his death.

In 1895, he married Minnie Pinkard, of Clanton, Alabama. This union was blessed with two children who survive him: a daughter, Marguerite Meadows McKee, and a son, Julian Meadows. His brother, Dr. Willis H. Meadows, his sister, Mrs. Dora Still, and his granddaughter Jean Evans McKee, also mourn his loss.

Dr. Meadows dedicated himself completely to the practice of his chosen profession, although in his busy life he enjoyed social companionship and found time for helpful activity in the civic and religious life of his chosen city of Greensboro. He efficiently served as President of the Guilford County Medical Society, and gave unstintingly of his skill and wisdom while serving on the staffs of the various local hospitals.

Our lamented member and friend was most energetic and progressive, always showing a helpful and friendly interest in the younger men who were entering practice—absorbing new ideas and new methods from them and giving them the benefits of a wisdom which could come only from long and broad experience.

Dr. Meadows applied himself most intensively to his practice, and his assiduous industry might make his name synonymous with "hard work", unless we agree with Sir James Barrie: "Nothing is really work unless you would rather be doing something else". Dr. Meadows loved the practice of his profession so greatly that, measured by Barrie's standard, his tremendous activity could not have been "work" to him because there was nothing that he liked to do more.

In addition to being blessed with a powerful physique and an active and capacious mind, he had a way of winning people to him, and during his more than four decades of practice in this community, there were few homes that were not graced by his presence at one time or another.

We feel keenly the loss of so great a friend. His character and his ideals will ever be an inspiration in strengthening and expanding our professional activities.

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DR. JOHN B. WATSON

By Hubert A. Royster, M.D.

Dr. John Blois Watson was born January 2, 1885, in Raleigh, N. C., the son of James R. and Lizzie King Watson. His grandfather was Dr. David Watson, and his great grandfather Dr. Robert Watson, both of Chatham County, N. C.

After studying pharmacy and practicing as a druggist for some years he entered the University of North Carolina Medical School and graduated at Raleigh with the class of 1908. He served an internship at St. Leo's Hospital in Greensboro, N. C., and located in Raleigh for the practice of his profession.

In 1912, 1915, and 1916 Dr. Watson took special courses in infant feeding, physical diagnosis, and clinical medicine at the New York Post-graduate Hospital. In addition to his private practice he taught pharmacy and pharmacology at the old Leonard Medical School for Negroes at Shaw University in Raleigh, and was a member of Rex and St. Agnes Hospital staffs. On December 27, 1920, he was married to Miss May Greenfield of Kernersville, N. C.

Dr. Watson was a Mason, a member of the Raleigh Academy of Medicine, the Wake County Medical Society, the North Carolina Medical Society, the Southern Medical Association, and the American Medical Association.

In 1929 he developed a septic endocarditis which so impaired his health that he was obliged to give us his practice. On July 15, 1938, he died in Raleigh.

This bare outline of Dr. Watson's comparatively short life by no means gives a complete or even adequate conception of his character and his attainments. He was a steadfast, reliable friend and companion. His career as a pharmacist, which finally led to his desire to study medicine, was built upon scientific rather than commercial instincts. The writer can testify to his success as a medical student. He was ardently interested, accurate in his thought, and ambitious to excel. A general average of ninety-two attained by him throughout his medical course was sufficient evidence of his studious habits and his application to work.

In his practice Watson was especially interested in gastro-enterology, and advanced to a high degree of efficiency in that branch of medicine. He was, however, a well-rounded medical man, skilled in diagnosis and therapeutics. Whenever consultation was needed, no matter what the type of case, he was ever prompt to call upon his associates. It is known that patients with intussusception and strangulated hernia owe their lives to his having referred them for assistance within the hour of recognition; and at least two women are living today, twenty years after operation for cancer of the cervix, due to Dr. Watson's early diagnosis and his immediate reference of their cases.

Of a kind, sympathetic disposition, Dr. Watson was beloved by his patients and his friends. Naturally he was conservative, quiet and ever reserved in manner, but was always genial and communicative to his intimates. On account of his prolonged period of ill health and his consequent early retirement, he was known to few of his younger colleagues. His contemporaries and his teachers will remember him with admiration and regret his untimely passing.

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DR. ROBINETTE BURNS HAYES

Dr. Robinette Burns Hayes was born on January 10, 1877, at Hillsboro. He was the son of William A. Hayes and the former Susan Burns Beard. He attended private schools at Hillsboro, and became a licensed pharmacist in North Carolina and Georgia. Later he took up medicine, and graduated at the University of Maryland Medical School in 1906, as University Prizeman. He interned at the University of Maryland Hospital in 1906 and 1907. He practiced medicine in Baltimore from 1907 to 1910, and in Fayetteville, from 1910 to 1917. He joined the A.E.F. in 1917, and was discharged in 1919. While in the A.E.F. he attained the rank of captain. Leaving the army he took up the practice of medicine in Hillsboro, and did general practice there until the time of his death.

He was a member of the Durham Orange County Medical Society, the North Carolina Medical Society, the American Medical Association, the Theta Kappa Psi Fraternity (served as President in 1910), the American Legion, and the Saint Matthews Episcopal Church.

In 1910 he married Minnie Boyd Anderson, of Maryland. To this union was born one son, William Anderson Hayes, and one daughter, Agnes Robinette Hayes.

Dr. Hayes fulfilled the requirements of a real doctor. He knew the science of medicine and the art of medicine, and he practiced both of them. He had an innate sense of justice and of democracy which made him minister to the poor and needy without any regard for his own financial gain. He believed that a principle was worth fighting for; yet he was amenable to reason. He was a most courteous and kindly person.

To sum up—and we admit frankly that anything we write will be far short of the real Dr. Hayes—he was loyal to his friends, skilled in his profession, and firm in his convictions.

It is fitting to say here that the last illness he diagnosed was his own. Before his operation he told the doctors attending him just what he had. His diagnosis was completely confirmed at the operating table. He did not rally as he should following the operation. He realized that he was going to die, and he faced death as fearlessly as he had faced life. He died on July 16, 1938.

Submitted by:

S. D. McPherson, M.D.
Raney Stanford, M.D.
Bryan N. Roberts, M.D.

JACOB FRANKLIN HIGHSMITH

Jacob Franklin Highsmith was a builder. There is always in all civilized society a small minority which take the lead in creating, improving, building up, that life may be made better for themselves, their children and their fellow men. J. F. Highsmith was preeminently one of this minority.

He was born near Roseboro, North Carolina on September 1, 1868, the son of John J. and Mary Ann Fowler Highsmith of Sampson County. He entered Wake Forest College and took the regular course there; later he went to Jefferson Medical College where he graduated in medicine. He located in Fayetteville in October, 1889, and was engaged in general practice until 1906. In November, 1889, he married Mary Lou White of Sampson County. They had eight children: Dr. J. D. Highsmith, Mrs. E. J. Wells, Mrs. Annie Campbell, Mrs. Louise Hardy, Miss Juanita Highsmith, Dr. J. F. Highsmith, Jr., Dr. W. C. Highsmith, and Mrs. John Caldwell.

In his youth a man of dauntless ambition, he finished his course with most of these ambitions satisfied. He had achieved the front rank of his profession; he had administered relief and healing to untold thousands along the way; he had founded the first private hospital in his state and had sustained and moulded it into a great institution for the alleviation of human suffering; and at the same time he had been a vital part of his community in all its truer phases, religious, civic, political, and business.

Fewer men, if any, did more for the establishment of sound medical and surgical practice than did Dr. Highsmith. He served as president of the Cumberland County Medical Society, president of the North Carolina Medical Society and former member of its Board of Medical Examiners, and at the time of his death was president of the Tri-State Medical Society.

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DR. CHARLES TORRENCE NESBIT

Dr. Nesbit was born in Westernport, Maryland, in 1870; and he passed away at his home at Bradley's Creek near Wilmington, on October 10, 1938.

Dr. Nesbit received the degree of Doctor of Medicine at Baltimore Medical College in 1893 and interned in Bellevue Hospital in New York City. He also studied in Europe. He came to Wilmington in 1907 and did private practice here until he was elected as the first health officer of the Consolidated Board of Health of New Hanover County in 1911. After a constructive and successful term of office in this organization he went to Akron, Ohio, to become health officer in that city, where he served successfully until 1920.

Immediately following his service in Akron, Dr. Nesbit was commissioned as an officer in the United States Public Health Service and was assigned to duty in Des Moines, Iowa, where he specialized in nervous and mental diseases. In 1922 he resigned this position to engage in private practice in Chicago. He remained there until 1924, when he came back to Wilmington to resume his practice here, continuing the specialty of nervous and mental diseases.

Dr. Nesbit's work as health officer in New Hanover County was a tremendous undertaking from its beginning; but he had the knowledge, the ability, and the courage to carry it on successfully and to establish a strong foundation for its future development. At this point I can do no better than to quote in full the editorial appearing in the Wilmington Morning Star on October 11, 1938:

"Charles Torrence Nesbit was at once a scientist and a philosopher who practiced his profession according to his own mind and smiled with amusement at those who differed. As a health officer he left behind a lasting monument in the simple fact that he transformed Wilmington from an unsanitary shamble into one of the cleanest cities in the south. Incidentally he banished typhoid and similar maladies that spawned in filth and started Wilmington on the way to health consciousness. An astute gentleman he moved through life without ostentation and left behind him a record of constructive service".

It is a source of gratification to the many friends of Dr. Nesbit that he lived to see his plans for Wilmington's health program fulfilled. His heroic efforts to this end were rewarded by the accomplishment of his ideals, and the generation unborn when he began his work here are, with their children, reaping today the benefits of his faithful service.

A pioneer health officer in North Carolina, he won the esteem of his co-workers here and of the entire medical profession in this State as well as in Ohio. His achievements in the United States Public Health Service were outstanding, and he has left an example that may well be emulated.

Dr. Charles Torrence Nesbit's remains lie in Oakdale "where the winds and the sea sing his requiem and shall forever more"; but his name and his works will long be remembered in this community that he loved and served so faithfully and so well.

Committee:
John B. Cranmer, M.D.
Avon H. Elliott, M.D.
W. Houston Moore, M.D.

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DR. W. C. ASHWORTH

Dr. Walter Clark Ashworth was born in Randolph County September 7, 1868, and died in the Wesley Long Hospital at Greensboro, N. C., on December 16, 1938. Funeral services were held at West Market Street Methodist Church in Greensboro by his pastor, Dr. J. B. Craven, and interment followed in Greene Hill Cemetery.

Dr. Ashworth took his course in medicine at the Ohio Medical College in Cincinnati and at the College of Physicians and Surgeons in Baltimore, Md. He did general practice at Kernersville, N. C., for eight years. He then became interested in mental and nervous diseases, and took special courses in this specialty at the New York Polyclinic.

He moved to Greensboro, N. C., in 1908 and established the Glenwood Park Sanatorium for Nervous and Mental Diseases and Drug Addictions, and was owner and manager of this institution at the time of his death. In 1904 he was married to Miss Berdie Sapp of Kernersville, who survives; and to this union two daughters, Mrs. Andrew Joyner of Greensboro, and Mrs. F. B. Morris, of Winston-Salem, survive.

Dr. Ashworth was a member and ex-president of this society, and a member of the North Carolina Medical Society, the Tri-State Medical Society, and the American Medical Association. None among us was more active in the work of these societies.

Your Committee on Obituaries begs leave to submit the following resolutions:

That, whereas it has pleased Almighty God to call unto Himself, into that larger and better life, the soul of our beloved brother, Dr. Walter Clark Ashworth: and, whereas the removal of this our friend and brother from the sphere of his activities among us leaves a distinct sense of sorrow and bereavement,

Be it resolved that we fellow members of the

Guilford County Medical Society, of which he was an active member and an ex-president, desire to give this fitting expression of our appreciation of his high character and of his long and devoted life of service in his chosen profession, and

Be it further resolved that these resolutions of respect be inscribed upon the permanent records of our society and that a copy be sent to his family and to the press.

(Signed) C. W. Banner
S. R. Cozart.

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DR. A. C. EVERETT

By Dr. W. D. James

The death of Dr. Arey Covington Everett of Rockingham, December 26, 1938, was of major significance and sorrow among the physicians and people of Richmond County and throughout the state. In his passing there has been removed from our midst a physician, who for forty-one years typified and represented the pioneer doctor whose life and work was characterized by humility, sincerity, kindness, and faithfulness.

Dr. Everett was born in Laurinburg, November 20, 1873, and was educated at the famous Quackenbush School in Laurinburg and at Oak Ridge, and was graduated from the University of Maryland in Medicine in 1897. He practiced in Rockingham and its vicinity from the time of his graduation until his death.

The Richmond County Medical Society honored him with the office of secretary-treasurer for forty-one years. At each annual meeting for the election of officers, he would hand in his resignation, but this was never accepted. As secretary-treasurer of this organization for this length of time, his honesty, tact, and resourcefulness were never questioned. At various times he served as president of the County Society and of the Fifth District Medical Society, proving his ability as a leader. He was also a member of the North Carolina State Medical Society, the Tri-State Medical Society, the Southern Medical Society, and was a Fellow of the American Medical Association.

Dr. Everett came from a sturdy family with a rich heritage. His native and acquired qualities peculiarly fitted him for his profession. He had a strong, pleasing personality and a large, loving, courageous heart. He was always deeply interested in his practice of medicine, and ardently took the opportunity to help all who suffered. He was a friend to everyone. For prompt attention to calls, whether from rich or poor, none excelled him. The influence of his work is far-reaching, for he never denied any worthy cause.

Even though he had not been in the best of health for several years, he led a busy, active professional life up until the day he died. He spent Christmas day quietly in his home with family and friends, and on Christmas afternoon suffered a heart attack. He passed away during the night. With sincere sorrow and grateful remembrance, his friends and members of this profession record their deep appreciation of the life and labors of this devoted Christian physician, who spent his whole life in ministering to suffering humanity.

DR. J. H. BOYLES

Funeral service for Dr. Joseph Henry Boyles, of 1710 West Market Street, whose death occurred January 24, 1939, at Piedmont Memorial hospital, was held January 26, 1939, at 3:30 o'clock in West Market Street Methodist church by his pastor, Dr. J. B. Craven. Interment followed in Forest Lawn cemetery.

Joseph Henry Boyles was born in Union county, the son of Rev. W. M. and Susan Boyles, September 27, 1873. After attending public schools and old Trinity, he took a medical course at the University of North Carolina. For a time prior to this, he was with the Odell hardware company, and, during the Spanish-American war, was in service in Cuba and the Philippines. Later he worked and studied in St. Luke's hospital, New York, and attended the College of Physicians and Surgeons in Baltimore. Completing his period of internship, Dr. Boyles returned to Greensboro, and was for a time associated with Dr. E. L. Stamey in the practice of Medicine. Later he was associated with Dr. J. W. Long in the operation of Greene Street hospital. Since that time, he has been actively engaged in practice.

About 12 years ago Dr. Boyles, associated with Dr. A. F. Fortune and Dr. J. G. Thomas, founded the Clinic hospital, now Piedmont Memorial hospital. He continued actively associated with the institution as a member of the medical staff, and was a leader in the development of the institution into a vital factor of community life.

Dr. Boyles had long been a member of the Guilford County Medical Society, the North Carolina Medical Society, and the American Medical Association. He was also a member of Percy Gray camp, United Spanish War Veterans, John Wesley Long Post, and Veterans of Foreign Wars.

Surviving are his wife, formerly Miss Ruth Sterne, Greensboro; one son, J. Henry Boyles, Jr.; two brothers, Frank C. and Marvin M. Boyles; and one sister, Mrs. Blanche Carr Sterne, all of Greensboro.

Your Committee on Obituaries begs leave to submit the following:

In the passing of Dr. J. Henry Boyles, Greensboro and the community lose one of those citizens whose obituary is most eloquently written in the record of their lives.

Dr. Boyles, veteran physician and surgeon, devoted his life to giving of encouragement, his personality, his strength and his skill wherever they were needed. That in the following of this career of humanitarian service he found time to join in the establishment and management of a hospital, to serve his country and to take a prominent part in church and community activities offers but further testimony to his usefulness. It is thus left to us merely to join with those whom he served, the community in which he exerted his influence, in appending a final "well done" and in giving thanks for the ministrations which he rendered, and the spirit which he manifested among us. It is especially sad when those who administer to others' ills are themselves claimed; but, withal, there is corollary emphasis upon eternal values and indestructible rewards.

Be it resolved that we fellow members of the Guilford County Medical Society, of which Dr. Boyles was an active member, desire to give this fitting expression of our appreciation of his high character and of his long and devoted life of service in his chosen profession, and

Be it further resolved that these resolutions of respect be inscribed upon the permanent records of our Society and that a copy be sent to his family. (Signed) S. R. Cozart.

DR. JOHN BERRY

Dr. John Berry, a member of this society, and for a number of years a prominent practitioner among us, passed away in his home at Southern Pines, May 25, 1939. He had been in ill health for several years and had retired from active practice.

Dr. Berry was born in Hillsboro. N. C., March 31, 1885, a son of the late Dr. John Berry and Mary Strayhorn Berry. His father was valedictorian of his class at Wake Forest, was a graduate of Jefferson Medical College, and served as surgeon to the 42nd Mississippi regiment, with the rank of captain. He did general practice at Hillsboro, N. C., and was well known to many of the older practitioners of this state and community. His mother, a member of an old and esteemed North Carolina family, was graduated from Edgeworth Seminary of Greensboro in the class of 1872.

Dr. Berry received his early education at Hart School, Hillsboro, and Clemson College in South Carolina; spent four years at the University of North Carolina (Chapel Hill), two years of which were devoted to the study of medicine; and was graduated second in his class at Jefferson Medical College in Philadelphia, 1908. After serving as interne at the Philadelphia Polyclinic following his graduation, he was appointed to the staff of the Pennsylvania State Tuberculosis Sanatorium, located at Mount Alto, Pa., and later was appointed deputy director of this institution. At the outbreak of the World War he volunteered his services and was appointed a first lieutenant, later being promoted to captain and major. A break in his health forced him to give up this work and he was given an honorable discharge.

After a period of rest and recuperation he came to Greensboro, and soon was able to build up a very active and lucrative practice. He was an able practitioner, with a genius for going into the details of every case and ferreting out those obscure symptoms that so frequently confront us. No physician in our midst enjoyed the confidence and esteem of his patients to a greater degree than did Dr. Berry.

On April 21, 1924, Dr. Berry was married to Miss Mary Strudwick of Greensboro, daughter of the late Judge and Mrs. Robert C. Strudwick of this city. To this union were born three children, Harriet, John, and Mary. Harriet died in early childhood.

While Dr. Berry lived in Greensboro, he was an active member of this society until his health failed, some four or five years ago, and he was forced to retire from active practice. He moved to the Sandhills, hoping there to regain his strength and be able to return to Greensboro and resume the work in which he was so interested and to which he had devoted his time and talent.

Funeral services were held at his residence in Southern Pines Saturday, May 27th, 1939, and were attended by a large concourse of devoted friends.

In the passing of Dr. Berry this society has lost an able, conscientious and devoted member; this community, a painstaking and capable physician; and all of us who were privileged to know him, feel that we have lost a sincere and valued friend.

Therefore be it resolved that this sketch of the life of Dr. Berry be spread upon the minutes of this society, a copy sent to the family of the deceased, and a copy to the Chairman of Obituaries of the State Society, to be included in their annual report.

(Signed) C. W. Banner, Chm.
S. R. Cozart
J. W. Slate,
Obituary Committee.

BOOK REVIEWS

LEUKEMIA AND ALLIED DISORDERS. By Claude E. Forkner, M.D., Assistant Professor of Clinical Medicine, Cornell University Medical School and Assistant Attending Physician, New York Hospital. Cloth. Price, $5. Pp. 333, with 73 illustrations in black and white, and 7 in color. The Macmillan Company, 1938.

This is a comprehensive monograph on leukemia which collects together in one volume all that is known about this group of diseases. The pathologic physiology of the blood and blood forming organs and its bearing on the structure and function of the organism as a whole is given particular consideration. The author states that, "this is the first attempt, in a comprehensive way, to correlate the factors of altered structure and function with the clinical manifestations of the disease." About 1600 references are cited in the text and listed at the end of the book, occupying a section of 54 pages. These references include all the work of any value that has ever been published on the subject, beginning with the first reports of the disease by Craigie, Bennett and Virchow in 1845. The table of contents and index are especially complete. One long chapter discusses the changes found in the various organs and organ systems. The chapter on treatment is comprehensive, and includes and evaluates every form of treatment that has ever been tried. In addition to the leukemias a large number of disorders, frequently considered separately, but bearing various relations to leukemia, are presented. These include reticulosis, reticulo-endotheliosis, pseudo-leukemia, leukemia, chloroma, leuko-sarcoma, and leukemoid states. The book is truly comprehensive and should be in the possession of everyone interested in disorders of the blood.

RECENT ADVANCES IN HEMATOLOGY. By A. Piney, M.D., Ch.B. (Birm.). M.R.C.P. (Lond.), Assistant Physician, St. Mary's Hospital for Women and Children, London. Fourth Edition. Pp. 312, with 8 coloured plates and 34 text figures. Price, $5. Philadelphia: P. Blakiston's Son & Co., Inc., 1939.

This book has been almost entirely re-written since the last edition in 1931. It is more than a review of the recent knowledge of hematology, as many well known facts are included as a background. The book therefore deals with the present position of hematology as well as the recent advances in our knowledge. It begins with a study of the circulating cells, their ancestors, and the organs in which they are formed. The pathological changes which occur are then taken up in considerable detail, and most of the book is devoted to these changes. The author presents his own belief that megaloblasts occur in post-embryonic life not as a normal part of maturation of red cells, but only as an abnormal response of the hematopoietic system, in the nature of a reversion to the embryonic type; however, he gives full attention to the most widely held views. The reviewer sees no good reason for assuming that the stages of blood cells in embryonic life differ materially from the stages of development in the adult, even though there are marked changes in the place of origin of different cells. The section on Ineffective Leukocytosis, after a discussion of the general principles of leukocytosis, has a number of pages devoted to specific changes found in various diseases. The leukemias and anemias are adequately discussed as well as the related diseases of the blood-forming organs. Throughout the book the author warns against imagining

"that there are, so to speak, a definite number of 'diseases', some of which still await discovery. In this sense there are no 'diseases'; there are only reactions, some of which, on account of their regularity, can be grasped as a sort of conceptual unity; but that does not entitle them to be regarded as self-existent entities—as diseases". This is a valuable book. The color plates are good, and the illustrations are clear and well chosen. There is a glossary at the end of the book and a list of references at the end of each chapter. This book has apparently been designed for the general practitioner, as the various disease states are frequently illustrated with case reports.

THE CLINICAL DIAGNOSIS OF SWELLINGS. By C. E. Corrigan, M.D., F.R.C.S. (Eng.), Lecturer in Surgery, University of Manitoba, Assistant Surgeon and Director of the Out-Patient Department, St. Boniface Hospital. Price, $4. Baltimore: The Williams & Wilkins Company, 1939.

In this day of highly specialized laboratory procedures it is stimulating to find a book which is concerned with diagnosis by clinical methods alone, without any dependence on laboratory work. Diagnosis is essentially an art, and the examiner himself rather than his laboratory aides must forever remain the final master of the court of medical decisions. The basis upon which this book is written is well expressed in the beginning of the first chapter as follows: "When attacking any problem it is first necessary to marshal all facts, weed out those that are non-essential or spurious and then proceed to deduce the solution from one's knowledge of the subject. Now the facts in this case are the physical signs and their elicitation demands training and experience. Fortunately however, there is no need to review the signs critically—all may be accepted as genuine. It is this note of authenticity that renders the problem delightful, particularly when contrasted with the interpretation of symptoms. All the bogeys of exaggeration, minimizing, dramatization and language difficulties which so frequently color the patient's complaints, are excluded from the picture. No matter who the patient, his swelling is more eloquent than his tongue. Can we but learn to converse in the language of physical signs which are so devoid of duplicity, the meaning or nature of the lump will usually become obvious." This book is soundly written, and interspersed throughout are historical references to some of the great clinicians of the past, many of whose names are attached to present clinical entities. The book is concerned only with swellings and is well illustrated with line drawings which bring out the salient points. It does not cover the entire field of surgery and is not confined to the commoner conditions, but rather to those in which the diagnosis is best reached by clinical methods. It is a thoroughly practical and usable book in clinical practice.

A TEXTBOOK OF BACTERIOLOGY. By Hans Zinsser, M.D., Professor of Bacteriology and Immunology, Harvard University Medical School; and Stanhope Bayne-Jones, M.D., Professor of Bacteriology, and Dean, Yale University School of Medicine. Eighth Edition, Revised and Reset. Price, $5. New York: D. Appleton-Century Company, Inc., 1939.

This book needs no introduction to the medical profession. It is intended for use by students of medicine and public health, and presents the fundamentals of bacteriology and immunology and the application of these to the understanding and control of infectious diseases. In this edition the section on pathogenic protozoa has been omitted, and obsolete material has been removed. This results in some reduction in size of the book. The advances in bacteriology made within the last few years are well covered. References are listed at the end of each chapter, and the usual section on methods is present.

TEXTBOOK OF NERVOUS DISEASES. By Robert Bing. Translated and enlarged by Webb Haymaker. Price $10. Pp. 838. St. Louis: The C. V. Mosby Company, 1939.

The neurologist and the internist alike will find this excellent translation of the fifth German edition of Dr. Bing's work an indispensable addition to his medical library. This book, unlike most textbooks of neurology, leaves the anatomy of the nervous system to other works, and concerns itself primarily with disease states of the brain, spinal cord and peripheral nerves. The book is clearly written, well translated, and well organized. The newer methods of treatment, including the use of thiamin chloride in the various conditions for which it is indicated are given full space.

In Robert Waterbury's preface to the American edition, reference is made to the lucid style employed by Dr. Bing. The book does make interesting reading, and one is constantly impressed with the consummate skill and accuracy of its famous author.

The chapter on convulsive disorders contains an accurate appraisal of the relatively new drug, dilantin, and explains its advantages over the time-honored bromides and phenobarbital.

There is a good chapter on headache, and a complete discussion of the psychoneuroses. Complete bibliographies are furnished throughout the book. Altogether it is a worth-while book, and merits a wide sale.

CLINICAL BIOCHEMISTRY. By Abraham Cantarow, M.D., Associate Professor of Medicine, Jefferson Medical College, Biochemist, Jefferson Hospital; and Max Trumper, Ph.D., Clinical Chemist and Toxicologist, formerly in charge of the Laboratories of Biochemistry of the Jefferson Medical College and Hospital. Second Edition, Revised. Price, $5. Philadelphia: W. B. Saunders Company, 1939.

This book has been thoroughly revised, and a number of new chapters and sections discussing new topics have been added since the first edition. The book is designed to correlate laboratory data with clinical findings in the field of biochemistry, thereby allowing the reader to select the appropriate tests valuable in diagnosis, and to interpret the data obtained from these tests in relation to the case at hand. In addition the book presents simply and accurately the fundamental principles of biochemistry as it is related to clinical medicine. The title has been changed from "Biochemistry in Internal Medicine" to "Clinical Biochemistry". A selected bibliography has been added at the end of each chapter, a marked improvement over the previous edition. At the end of the book there is an outline of clinical diagnostic features of various disorders, which is cross-indexed with the rest of the book. There is also a table of the normal chemical standards of the blood and cerebrospinal fluid, and of various chemical procedures. The book ought to be of distinct aid both in increasing the understanding of the biochemistry of the body, and in choosing and interpreting laboratory procedures.

The Frontiers of Science.—In the year 1843 the Commissioner of Patents said in his report: "The advancement of the arts from year to year taxes our credulity and seems to presage the arrival of that period when human improvement must end."—Winfred Overholser: The Broadening Horizons of Medicine, **Science**, 90:2338 (Oct. 20) 1939.